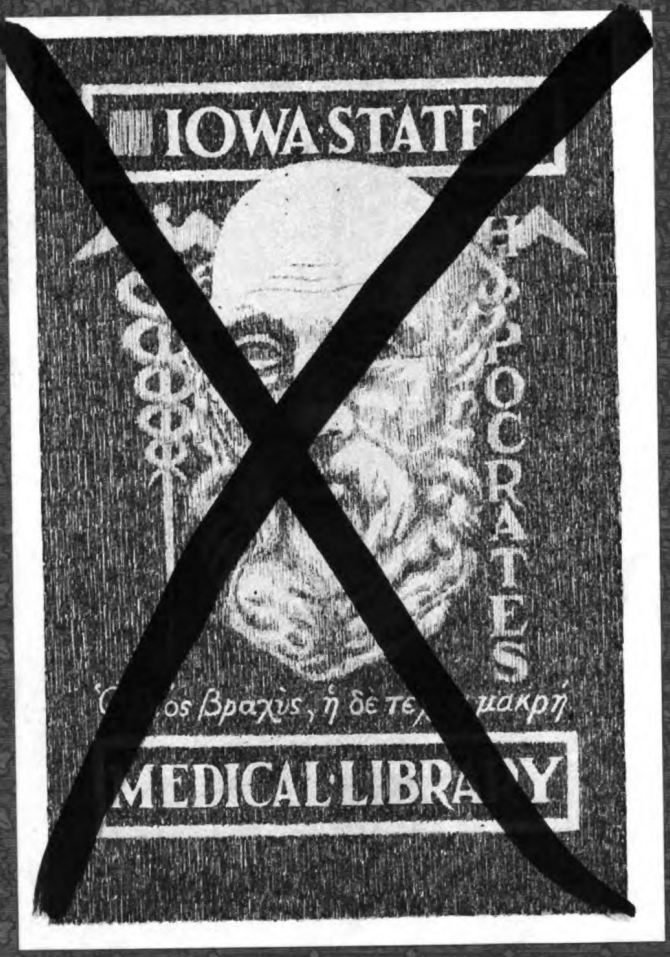
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A RECOMMENDATION

The following paragraph, which speaks for itself, is taken from "An Outpost in Papua," by Arthur Kent Chignell, Priest of the New Guinea Mission :—

> "Rummaging in the Sydney book-shops ..... I discovered, and bought for ninepence, a secondhand copy of a little book that had been issued only two years before, 'THE MAINTENANCE OF HEALTH IN THE TROPICS,' written by W. J. Simpson, M.D., and published under the auspices of the London School of Tropical Medicine by John Bale, Sons and Danielsson, of Great Titchfield Street, in London. I give the details fully, not only because that book was the very best ninepenny-worth I ever bought, but because a copy should come to New Guinea with everyone who enters the country. More than that, and because a book is but a lifeless thing until it is read and understood, it would be very well if every volunteer for the New Guinea Mission could be examined as to its contents before he is accepted, and catechized as to his willingness to live up to its teaching before he is allowed to sail."

A new edition of the above-mentioned book, thoroughly revised and brought up to date, has recently been published, price 3s. 6d. net, post free 3s. 10d., and can be obtained from the Publishers.

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DR. [illegible]
CLINTON, IOWA

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ABSTRACT OF A

Hunterian Lecture

ON

PAGET'S DISEASE OF THE NIPPLE.*

Delivered before the Royal College of Surgeons of England on Feb. 16th, 1917,

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(From the Bland-Sutton Institute of Pathology, the Middlesex Hospital.)

MR. PRESIDENT AND GENTLEMEN,—It is impossible to lecture on Paget's Disease of the Nipple without quoting from his original paper,[1] not only as a token of respect to pioneer work, but also because little of importance has since been added to its discoverer's clinical description of the disease. Moreover, it is impossible to summarise the paper, for it possesses in the highest degree those virtues of compression and concentration which are sometimes lacking in the medical writing of to-day. Sir James Paget says:—

I believe it has not yet been published that certain chronic affections of the skin of the nipple and areola are very often succeeded by the formation of scirrhous cancer in the mammary gland. I have seen about 15 cases in which this has happened, and the events were in all of them so similar that one description may suffice.

The patients were all women, various in age from 40 to 60 or more years, having in common nothing remarkable but their disease. In all of them the disease began as an eruption on the nipple and areola. In the majority it had the appearance of a florid, intensely red, raw surface, very finely granular, as if nearly the whole thickness of the epidermis were removed; like the surface of very acute diffuse eczema or like that of an acute balanitis. From such a surface, on the whole or greater part of the nipple and areola, there was always copious, clear, yellowish, viscid exudation.

..... it has happened that in every case which I have been able to watch, cancer of the mammary gland has followed within at the most two years, and usually within one year. The eruption has resisted all the treatment, both local and general, that has been used, and has continued even after the affected part of the skin has been involved in the cancerous disease.

The formation of cancer has not in any case taken place first in the diseased part of the skin. It has always been in the substance in the mammary gland, beneath or not far from the diseased skin, and always with a clear interval of apparently healthy tissue.

Subsequent Observations.

Erichsen drew attention to the sharp definition of the eczematous patch, and made the important observation that the affected area is slightly indurated, a point of distinction from ordinary chronic eczema. Wickham and Bowlby noted the flattening and disappearance of the nipple, sometimes passing into retraction, which is a constant feature of the disease.

A specimen in the Museum of the Cancer Hospital, taken from a case under the care of Mr. Charles Ryall, appears to indicate that Paget's disease may undergo complete spontaneous healing. In this case a carcinoma is present in the subjacent breast. Partial attempts at epitheliation are frequently seen in the diseased area.

Histology.

Two years after Paget's disease had been described the foundations of its histology were well and truly laid by Sir H. T. Butlin. He found that the mucous layer of the epidermis of the eczematous skin underwent proliferation and increased in thickness. It was occasionally traversed by fine fibrous bands, fibro-cells or spindle-cells. The corium and subcutaneous tissue were indurated and infiltrated with small round cells (leucocytes). The milk-ducts were widely open or distended. They were not lined as in the normal condition by cylindrical epithelium, but contained frequently large masses of epithelium of the squamous or glandular form. The connective tissue round the ducts was often infiltrated with small round cells. These changes in the ducts extended into the breast an inch or more beneath the nipple. In one of the two cases examined the acini showed a proliferation similar to that often observed in the neighbourhood of carcinoma of the breast.[2]

Butlin's observations are a very accurate description of the histological appearances. He inferred from them, as Paget did also, and both, I think, erroneously, that the eczema was the primary condition, and that the deeper changes were the result of it. It is to be specially noticed that Butlin found no sign of malignancy in the surface epithelium, and he noted the interesting fact, to which I shall again refer, that it might be invaded by the connective tissue of the dermis. He noted the induration and infiltration of the corium, which I believe to be an important guide to the pathogenesis of the disease.

ENUMERATION OF ERRONEOUS PATHOLOGICAL VIEWS.

Since 1876 the exact pathology of Paget's disease has remained a perennial subject of doubt and debate. It may be well at the outset to clear the ground by enumerating those views concerning it which are beyond doubt erroneous.

Is Paget's disease an ordinary eczema? On the joint authority of Dr. Graham Little and of my colleague Dr. Pringle, I can tell you that the microscopic appearances of Paget's disease are quite unlike those of an ordinary eczema. Moreover, ordinary eczema of the nipple yields to treatment, and induration is absent in chronic eczema.

Parasitic theory of Darier.—In 1889 Darier found within the squamous epithelial cells of the diseased nipple certain peculiar appearances, now generally admitted to be the result of cell-degeneration, which he believed to indicate the presence of intracellular parasites. His views gave rise to an extensive literature and to an admirable monograph by Wickham, but since he has had the courage and frankness to abandon them they need not further detain us.

Distinction from squamous-celled carcinoma of the nipple.—It is necessary to distinguish sharply between squamous-celled carcinoma of the nipple and Paget's disease. Dr. Browning has lent me a characteristic example of squamous carcinoma which I now show you. In squamous-celled carcinoma of the nipple there is seen a hard, elevated tumour of greater area than the normal nipple, which it replaces, and bounded by an everted or rampart-like edge. The flattened top of the swelling is irregular from ulceration, often sloughy, and it lacks the smoothness and brilliant colour which characterise Paget's disease. Microscopically, squamous carcinoma presents the usual blunt down-growing columns of prickle epithelium containing cell-nests, while in Paget's disease, though the papillæ are exaggerated and the thickened stratum mucosum may show a few rudimentary cell-nests, there is no sign of invasion of the dermis by the overlying epidermis.

Paget stated rightly that the formation of cancer never takes place first in the diseased portion of the skin, though the eczematous surface might later become involved in the cancerous tissues from which at first it was separated by an interval.

Several observers have found microscopic evidence in Paget's disease of epitheliomatous down-growth such as precedes or constitutes a squamous carcinoma of the skin; among them are to be reckoned Darier, Karg, Fisse, and Rolleston and Hunt. Butlin and Wickham found appearances suggestive of squamous carcinoma. Bowlby, Unna, and G. T. Jackson reject the idea. What is the reason for this conflict of evidence? It appears to depend first upon the fact that squamous carcinoma of the nipple is sometimes erroneously diagnosed as Paget's disease upon clinical examination. But it chiefly arises from this circumstance that in Paget's disease there is elongation of the inter-papillary columns of epithelium (Wickham, Bowlby, Rolleston and Hunt), together with an invasion of the epidermis by islets of fibrous tissue. It will be shown later that this elongation is due to passive stretching, not to active down-growth.

We may, I think, dismiss the view that there is any real connexion between Paget's disease and squamous carcinoma of the nipple, though it still holds a place in some current text-books of pathology. But a word must be said about a curious German variant of this theory.

Intra-epidermal carcinoma.—The degenerate deeper layers of the epidermis which contain the large clear cells known as Paget's cells, were taken by Schambacher to be a layer of

* This lecture will appear in full with illustrations in an early number of the British Journal of Surgery.

[1] Sir James Paget, St. Bartholomew's Hospital Reports, 1874, x.

[2] The Minute Anatomy of Two Breasts, the areolæ of which had been the seat of long-standing eczema, by Henry Trentham Butlin, F.R.C.S., Surgical Registrar to St. Bartholomew's Hospital, Medico-Chirurgical Transactions, 1876, lix., 108-9.

malignant epithelium thrusting itself between the dermis and the superficial layers of the epidermis. He and Jacobaeus thought they could sometimes trace a continuity between these cells and the cells of a glandular carcinoma of the breast beneath.

This is not the case in any specimen I have examined. In some exceptional cases the carcinoma beneath may infiltrate up to the epidermis, and its cells may abut on squamous epithelium. But the relation is one of contiguity or slight intermixture, for, as Fisse truly stated, the two varieties of cells remain easily distinguishable at a little distance from their point of contact.[3]

CHANGES IN THE EPIDERMIS IN PAGET'S DISEASE.

What, then, in point of fact are the changes which are found in the epidermis in Paget's disease? They may be divided into two stages, hypertrophic occurring at the periphery of the affected area, and atrophic occurring at its centre. Over the whole area the horny epithelium has for the most exfoliated and disappeared.

Hypertrophic Stage.

Butlin, Thin, Duhring, and Wile drew attention to the proliferative thickening seen in the deeper layer, or stratum Malpighii of the epidermis. This proliferation accounts for the slightly elevated, sharply defined border which clinically characterises the disease (Thin, Duhring, Wickham). Wickham accurately pictures the epidermis as riddled with vacuoles and presenting cellular disorganisation with consecutive proliferation. The cells dissociate and lose their normal close cohesion. The individual cells display the polymorphic degeneration on which the parasitic theory was founded. Rifts and clefts appear in the close structure of the epithelium, more especially in the interpapillary processes which often display a central cavity or vacuole-like space (Duhring and Wile). Duhring, Wile, Rolleston, and Hunt agree in describing this process as an œdematous degeneration of the epidermis, a description clinically confirmed by the thin alkaline discharge characteristic of the disease. The length of the interpapillary columns of epithelium is much increased, sometimes to four times the normal. But the naked eye, or a low power of the microscope, shows that the general boundary line between epidermis and dermis remains perfectly defined, without a suggestion of epitheliomatous downgrowth.

Atrophic Stage.

The gradual ruin of the epidermal architecture is hastened by intrusive bands of fibrous tissue or islets of round-celled infiltration which insinuate themselves into the clefts of the moribund epidermis like ivy in an old wall. The overgrown stratum Malpighii no longer holds together, and is reduced to a layer two or three cells thick, or is completely cast off in the discharge, exposing the tips of the papillæ. The elongated interpapillary columns degenerate and disappear. During this process islets of epithelium, which simulate epithelial downgrowths, are often for a time left embedded in the fibrous tissue. But at a later stage the interpapillary columns have disappeared, and the papillæ are in consequence laterally fused and unrecognisable. Finally, and this stage is not often reached, the surface of the nipple is bare of epithelium, and is formed by a layer of granulation tissue.

From this account it is obvious that the epidermis is the passive victim of deeper changes, not the assailant of the tissues beneath. No analogy can be drawn between the flat florid weeping surface of Paget's disease, persisting for long periods without ulceration or fungation, and any known form of malignant disease. Here I may turn aside for a moment to consider other cases in which degenerating or ill-nourished epithelium suffers invasion by fibrous tissue.

Invasion of the epithelial layer of the skin by fibrous tissue is a process which is very common though it is not recognised in works on pathology. It may be studied at the bottom of the tonsillar crypts where the squamous epithelium is seen in the process of destruction by intrusive bands of fibrous tissue. I have shown that de Morgan's spots, which are such common manifestations of cutaneous senility, are due to telangiectases occurring in intrusive islets of fibrous tissue embedded in the thickness of the epithelial layer of the skin.[4]

[3] *Nature of the carcinoma accompanying Paget's disease.*—In the microscopic examination of specimens of breast carcinoma accompanied by Paget's disease, though most observers agree with Thin that the growth is usually a duct carcinoma, doubt may arise whether the growth is an ordinary spheroidal-celled carcinoma. Sometimes the appearances of both forms of growth are present, as in Jordan Lloyd's case and in one of my own. This difficulty has been cleared up by Lenthal Cheatle, who has proved that many so-called spheroidal-celled growths are really duct carcinomata in which the epithelium has lost its original columnar character.

[4] Handley: Archives of the Middlesex Hospital.

Our discussion so far has led us to reject the parasitic theory of Paget's disease, to distinguish the affection sharply from epithelioma and to conclude with certainty that the surface epithelium of the affected nipple is not the seat of any malignant change, but that the changes in it are inflammatory or nutritional only and dependent upon œdema.

CHANGES IN THE DERMIS.

We have considered the changes in the epidermis, those in the dermis remain to be described.

Broadly speaking they consist of œdematous swelling of the papillæ, with consequent stretching of the interpapillary columns of epithelium. A band of round-celled infiltration is seen in the papillary layer, separated at first by a narrow interval of intact dermis from the overlying epithelium. According to Unna, this band of infiltration is composed chiefly of plasma cells. It lies in the plane in which the cutaneous lymphatics originate, a point to be especially noted. In some specimens the band of infiltration is absent, the superficial layer of the dermis is fibrotic, and the papillæ have disappeared, appearances indicating the fibrosis which ultimately results from round-celled infiltration. The dermis is thickened, producing the superficial induration which is clinically evident.

The deeper layers of the dermis, though they show thickening, are otherwise little changed. They show perivascular collections of round cells, and in some specimens groups of epithelial cells lying in lymphatic spaces can be seen. This description, based upon my own observation, can be confirmed in every particular upon a perusal of the literature of the subject. Broadly speaking, it shows a chronic œdema of the dermis with pachydermia.

As the papillæ increase in size they stretch the interpapillary columns of epithelium and produce the deceptive appearance of downgrowth in these columns which has been noted by so many observers. Later the mutual pressure of the swollen papillæ leads to the atrophy and disappearance of the interpapillary columns. The fused papillæ are then no longer recognisable, and they appear to undergo a process of fibrosis which flattens them out. The overlying epithelium, partly as the result of mechanical stretching and partly from œdema, suffers the changes already described. It is probable that in these changes superficial bacterial infection plays some secondary part, though an undetermined one. Of course, staphylococci are always present in the epidermis.

CARCINOMA THE PRECURSOR OF PAGET'S DISEASE.

We must next consider a paper by Dr. George Thin, published in 1881. Thin put forward the view that the primary lesion is an ordinary carcinoma of the breast, originating in the ducts, and that the changes in the nipple are secondary both in time and in importance. As Thin truly says[5]:—

From what we know of the slow changes that frequently mark the earlier stages of cancer of the skin (in rodent cancer, for example), there can be little difficulty in accepting it as probable that cancerous changes are developing in the ducts long before they have given rise to sufficient induration to produce a palpable tumour.

His paper marks, in my opinion, a great advance. It has unfortunately been misunderstood owing to an unfortunate choice of title. In order to distinguish Paget's eczema sharply from true eczema he suggested for the former condition the name "malignant papillary dermatitis." The word "malignant" is misleading, for it suggests what Dr. Thin did not believe—the malignancy of the surface epithelium in Paget's disease.

To prove in all cases the correctness of Thin's view that carcinoma of the breast precedes eczema is impossible. But there is much evidence in its favour.

Impalpable Carcinoma.

A carcinoma of the breast may exist for years, may permeate the breast-lymphatics, may disseminate, and may cause death without ever giving rise to a palpable tumour in the breast. Time forbids me to discuss this subject in detail, and I have dealt with it fully elsewhere. This drawing which I show you is an impalpable carcinoma arising in a breast rather shrunken and indurated by chronic mastitis. The growth was not adherent to skin or fascia, and could not be distinguished by touch from the granular mastitic induration of the remaining part of the breast. But it had already given rise to infection of the axillary glands at the time when I removed the breast.

You are familiar with cases where a mass of carcinomatous glands develops in the axilla, secondary to a carcinoma of the

[5] Thin: Brit. Med. Jour., May 14th and 21st, 1881.

breast which can only be detected by microscopic examination.

In Paget's disease flattening or retraction of the nipple is an early sign, appearing long before a lump is felt in the breast. It is recognised as peculiarly a sign of carcinoma. Yet even at the time when a lump can be felt it is rare to find enlarged axillary glands (Wickham). The combination of characters—early retraction and long freedom of glands—indicates a chronic carcinoma of low virulence.

There is, therefore, no improbability in the assumption that carcinoma precedes and causes Paget's disease even when no lump can be felt in the breast.

In this connexion Mr. Lenthal Cheatle's case is of interest. By his method of large sections cut with a giant microtome he found a minute focus of carcinoma in a breast the seat of Paget's disease, although clinically and macroscopically there was no sign of carcinoma in the breast.

I may remind you that in not a single case of Paget's series did a carcinoma fail to show itself sooner or later, and in no case did the carcinoma first show itself in the diseased area of skin. Jamieson, quoted by Sheild, relates a case in which Paget's disease persisted for 20 years without the development of a cancer in the breast. Even in such a case the presence of a cancer during the whole period cannot be excluded, for the life of a breast carcinoma may exceed this duration, and it is even possible that the growth might undergo spontaneous cure, leaving Paget's disease as a result.

How does a Carcinoma of the Breast Cause Paget's Disease?

Accepting Thin's view that Paget's disease results from a pre-existing carcinoma, we are arrested by the question, How does carcinoma cause Paget's disease?

Thin believed that the papillary dermatitis, or so-called Paget's eczema, resulted from the irritant action of an acrid cancerous discharge from the mouths of the milk ducts. The suggestion is unconvincing, for Paget's disease may appear in cases where no moisture about the nipple has at any time been noticed.

In approaching this question I will ask you to recall to your memory certain researches of mine on the dissemination of carcinoma which date back to the year 1904. It may now be regarded as established that the main factor in the dissemination of carcinoma is the process of permeation, the growth of tendril-like cylinders of cancer cells along the easy routes provided by the lumina of the lymphatic vessels. This process must be sharply distinguished from infiltration of the tissue interspaces.

Obviously one of the results of permeation is to block the lymphatic vessels. It was, therefore, not surprising to find that lymphatic œdema frequently follows in the tissues whose lymph should normally drain away along the obstructed lymphatic vessels. Œdema may sometimes come on before permeation has reached the lymphatic vessels of the œdematous part owing to a block lower down the course of the lymphatic stream.

The commonest example of this condition is early cancer *en cuirasse*, which in its origin, and apart from the nodular invasion by cancer which accompanies its later stages, is a pure lymphatic œdema due to the blocking of the lymphatics of the subjacent fascial plexus by permeation. I have suggested for it the name "cancerous pachydermia." The affected skin becomes thick and leathery, and in one early example which I examined the thin skin of the breast had attained a thickness of 6 mm., though it showed no sign of cancerous infiltration. Sometimes, but not usually, the affected skin becomes red and discoloured or again covered by eczematous crusts.

Histologically the epithelium is found thin and atrophic with its horny layer peeling off. Round-celled infiltration may be found in the superficial layers of the dermis, while in the deeper layers are perivascular collections of similar round cells, marking out the track of the obstructed lymphatics. The papillæ of the dermis, at first swollen by œdema, are later flattened out and obliterated by a secondary fibrosis.

Causation by Œdema due to Permeation of Lymphatics.

The similarity of these appearances with those seen in the skin of the nipple in Paget's disease was too strong to be overlooked, and I formed the definite opinion that Paget's disease is due to lymphatic œdema of the nipple dependent on the blocking of the lymphatics by permeation extending from a pre-existing carcinoma of the breast. The idea was confirmed by the definite papyraceous induration which is found in the affected area. It explained the persistence of the smooth, red, raw area over long periods of time without marked tendency to ulcerate or fungate—facts impossible to associate with a surface composed of malignant tissue. The serous discharge was a lymphorrhœa from the blocked area of the skin. The association of chronic "eczema" with lymphatic œdema is a familiar one, often seen on the legs in cases of elephantiasis and in other milder grades of lymphatic obstruction. The peculiarities of Paget's "eczema" might be explained by the anatomical peculiarities of the nipple, its rich blood-supply, its thin skin. The lymphatics of the ducts converging to the subareolar plexus would naturally carry permeation with especial rapidity to this plexus in the form of growth—namely, duct cancer, which is particularly associated with Paget's disease. Subsequent fibrosis of these lymphatics would naturally lead to flattening or retraction of the nipple.

But upon consideration it appeared to me that the case thus made out was a *prima facie* one only. Since 1904 I have taken such opportunities of examining cases of Paget's disease as have presented themselves, hoping to find a case in which permeation could be demonstrated. Meantime in 1912 I put my views briefly on record as a statement of opinion.[6]

The difficulty to be overcome lay in the fugitive nature of the process of permeation. A permeated lymphatic becomes distended by the growth of the cancer cells within it, and an inflammatory reaction is thus excited. Round-celled infiltration is followed by fibrous tissue formation, and the included cylinder of cancer cells is ultimately strangled by the contraction of this newly formed fibrous tissue. The original lymphatic is now represented by a solid fibrous thread, and all local traces of the carcinoma have disappeared leaving lymphatic obstruction as a legacy.

It was not until after 12 years that by a fortunate chance I met with the very early example of Paget's disease which I shall now describe. It showed a perfect and nearly complete permeation of the lymphatic vessels of the "eczematous" area of skin. (Figs. 1 and 2.) In looking at the section I was able in some degree to share the sensations of the astronomer Adams when he first beheld the planet of his calculations in its predicted position.

A healthy looking and well-developed man of 49 was recently sent to me by Dr. J. W. F. Jewell. The patient noticed a button-like induration of the right nipple four months before he sought medical advice. There had been no pain and no discharge from the nipple. The nipple was flattened, while the areola, slightly raised above the surrounding surface, presented a bright red, slightly granular, dry surface with a few epidermal scales adherent to it. Beneath the indurated nipple was a little hard growth adherent to the overlying skin, but movable on the fascia beneath. The glands in the right axilla were hard and slightly enlarged. The growth was removed, together with the pectorals and the axillary glands, and the patient made a good recovery.

Histologically, the axillary glands were free from growth. The primary growth was a very cellular carcinoma, sharply marked off from the surrounding tissues. Its infiltrative powers were therefore rather low. On its cutaneous surface, however, it had obtained access to the subareolar lymphatic plexus, and so to the cutaneous lymphatics. These vessels were completely and perfectly injected as by an artificial injection fluid. In the papillary processes of the dermis the blunt finger-like dilated vessels forming the commencement of the lymphatic system were distended by cancer cells exactly like the cells of the growth. (Fig. 1.) The appearance presented is just that of a dilated lacteal in an intestinal villus. Running out of ampullæ of origin are narrower vessels which can be seen in some sections uniting in the superficial layers of the dermis to form vessels of capillary size, presenting the moniliform dilatations which characterise lymphatic vessels. These vessels take a course vertical or oblique to the skin surface, and in the sections are often cut longitudinally and present Y-shaped junctions. They run down to, and enter, the subareolar plexus, which is seen lying between the skin and the closely subjacent breast tissue as a number of vessels of larger diameter cut for the most part transversely, since the section is at right angles to the plane of the plexus.

Serial sections afford clear proof that the longitudinally cut groups of cancer cells really lie in cylindrical vessels and not in chink-like spaces. The whole arrangement of the vessels stamps them as belonging to the lymphatic and not the blood vascular system.

[6] Choyce's System of Surgery, vol. iii., p. 12.

In horizontal sections the comparison of the cancer-filled spaces in the papillæ with the lacteal of an intestinal villus still holds good. In such sections passing just deep to the apices of the papillæ a circular group of cancer cells occupies the middle of each papilla. This appearance could never be produced by fortuitous infiltration. It indicates with certainty that the cancer cells occupy pre-formed anatomical spaces—namely, the vessels of origin of the lymphatic system. (Fig. 2.)

Evidence Afforded by Above Case.

A superficial critic might assert that what I have taken to be lymphatic vessels are in truth excretory ducts, passing to open on the surface of the skin. A careful search through all my sections has shown that a zone of dermis invariably intervenes between the groups of cancer cells and the under surface of the epidermis. Moreover, it is obvious that the apices of the V-shaped unions of the vessels in question are directed away from the skin surface, not towards it, as would be the case if they belonged to the excretory apparatus of the skin. Moreover, in numerous sections of the normal nipple no similar appearance could be detected.

To complete the proof that my section shows lymphatics infected by cancer I attempted artificial injection of the lymphatics of the nipple with soluble Prussian blue. My efforts in this direction have been limited by the preoccupations of the war. But in one successful case the Prussian blue penetrated the papillæ of the skin almost to their tips, occupying the same central position as the cancer-filled spaces in my specimen. This specimen of injected skin must be allowed considerable anatomical value as demonstrating—so far as I know for the first time—the anatomy of the origins of the human cutaneous lymphatics. It seems possible that this knowledge may be the key to advances in our knowledge of the pathology of various diseases of the skin.

In regard to the actual measurements of my specimen of Paget's disease—

Over an area of 2·5 mm. the epidermis is reduced to a layer consisting of a thin sheet of the rete Malpighii with deeply extending interpapillary processes as much as ·6 mm. in length—i.e., about four times the normal length. Beyond the periphery of this circle is an area of hypertrophied and thickened epidermis forming a circle with an outside diameter of 6 mm. Here also the interpapillary columns of epithelium are much elongated. This is due, not to downgrowth of the epithelium, but to œdematous hypertrophy of the papillæ of the corium, with consequent stretching of the interpapillary columns, for in the centre of the area the interpapillary columns are undergoing atrophy and some of them have disappeared altogether.

Permeation of the skin lymphatics is recognisable over a circle 6·5 mm. in diameter, and extends therefore just a little beyond the point where marked changes in the epithelium cease. Permeation of the subareolar plexus extends over an area of 10 mm.

These measurements show beneath the circular red area of dermatitis a larger circular area of permeated lymphatics, and beneath this again a still larger circular area of permeated deep lymphatics belonging to the subareolar plexus.

Now the tendency of Paget's disease to spread centrifugally from its point of origin is a commonplace. It may be inferred that that plane of the superficial tissues in which the affected circle is largest is the plane first affected. The relative size of the infection circles measures in terms of space the lapse of time since each of the layers was invaded, and therefore the order of their invasion. That is to say, the growth at first extends from the breast to the subareolar plexus and blocks it by permeation. Next the process extends to the tributary lymphatics running from the skin to the subareolar plexus. Lastly, as a result of lymph stasis from permeation, œdematous hypertrophy of the papillæ is seen and nutrition fails in an area of the overlying epidermis.

It is possible, of course, to conceive of the process reversed, and to assume that it spreads more rapidly once it reaches the subareolar plexus. But the permeation of the lymphatics of the dermis cannot possibly be the result of the changes in the epidermis. For the cells contained in these permeated lymphatics are not cutaneous cells, but cells originating from the mammary epithelium. For this reason I am entitled to conclude that the changes in the epidermis are secondary to the permeation of the dermal lymphatics, that the "eczema" is secondary to a pre-existing carcinoma.

A third possibility remains, that the dermatitis and the permeation of the dermal lymphatics are independent events. If so, how comes it that the areas are concentric? At either edge of the circles permeation of the dermal lymphatics is seen extending under œdematous skin just beyond the edge of the eczematous area. If this is chance, books of logic might as well be burnt.

In this case the eczema had been present for four months only, whereas the average duration of the disease at the time of operation is something more like four years, ample time for the fibrotic processes to destroy the lymphatics and obliterate all evidence of pathogenesis. It is probably useless to look for permeation in the skin if the eczema is of long standing. Those who would ask for evidence of permeation in every case of Paget's disease—who demand it to be shown in every case of a large series—fail to appreciate that disease is a biograph film and not a static entity, and that only one picture on the film, one page torn from the novel, can be fixed and examined in any one case. In most cases the picture or the page is inconclusive or insignificant. Sometimes it reveals the essential secret.

The evidence of this case does not stand alone.

A figure of Wickham's[7] (Plate ii., Fig. 2) almost duplicates the specimen I have just demonstrated. It shows permeation extending under normal epithelium, while beneath the eczematous areas are permeated lymphatics distended by proliferated cancer cells, running vertically upwards into the papillary zone of the dermis. Wickham appears to have considered that the epithelial masses were down-growing processes of the epidermis. His figure proves the incorrectness of this view, for the largest of these masses, though it touches the under surface of the epidermis, is sharply defined from it.

Duhring and Wile found in the middle and lower layers of the corium alveoli of varying size, some of them "linear" containing typical carcinomatous epithelium. These were present in both the cases they examined; and their observation distinctly points to permeation of the dermal lymphatics. It is the more important in view of the general accuracy of their histological descriptions.

I have also found evidence of persisting permeation in the deeper layers of the dermis in several cases of Paget's disease.

Pathological Picture of the Disease.

If the early specimen I have submitted to you be taken as the key and starting-point, the various isolated, otherwise unintelligible, phenomena of Paget's disease fall into their places like pieces in a jig-saw puzzle. Let me briefly picture the pathology of the disease in the light thus afforded.

A carcinoma starts in the smaller ducts of the breast, perhaps exceptionally from the acini or the larger ducts. Usually, without producing a palpable tumour, it permeates the breast lymphatics widely. The rich plexus of lymphatic vessels around the ducts forms an especially easy and convenient channel for permeation, and the lymphatic block extends along them to the subareolar plexus beneath the nipple.

The cutaneous lymphatics about the nipple are now dammed up so that lymph cannot return from them. Later they are themselves permeated, but possibly this is not always the case. At this stage, and before any lump has appeared in the breast, the skin of the nipple and the mucosa of the ducts begin to show changes dependent upon lymphatic obstruction. The epithelium shows disintegration and degeneration of its superficial layers with proliferation of the deeper layers. These changes are nutritional and non-malignant. The dermis becomes thickened by solid lymphatic œdema. The lymphatics of origin in the superficial layer of the dermis may be found filled with cancer cells, which are also to be seen in the lymphatics of the subareolar plexus.

The permeated lymphatics now undergo the usual process of perilymphatic fibrosis; they become surrounded by aggregations of inflammatory round cells, and later by young fibrous tissue, which contracts upon and destroys the included cancer cells. In most cases at the time the disease is removed the destruction of the cancer cells has been consummated, and there is seen merely a band of round-celled infiltration in the superficial dermis, while in the deeper dermis perivascular aggregations of round cells indicate the destruction of the lymphatics which are known

[7] Wickham, Louis: Maladie de Paget, Paris, Masson, 1890.

to accompany the blood-vessels in this layer. In other and later cases organisation into fibrous tissue is complete, round cells have disappeared, the papillæ have been destroyed by the fibrous contraction which has taken place in them, and nothing remains to show that the lymphatic vessels of the dermis have been obliterated and replaced by fibrous cords save and except the persistent changes in the epithelium and the œdematous thickening of the dermis.

In regard to the changes in the large ducts, these are evidently similar in nature to those found on the surface of the nipple, and they depend upon the same cause—namely, lymphatic obstruction from permeation and subsequent fibrosis. The only difference is that the shed epithelium cannot get away, and it remains *in situ*, plugging and distending the ducts with a degenerate mass of débris.

Lastly, even in the rare cases where, though the Paget's disease has lasted many years, yet no carcinoma has made its appearance, it is probable that an atrophic scirrhus, which may have undergone partial or complete cure, preceded the onset of the Paget's disease. But the possibility that the lymphatic obstruction in such cases is of inflammatory origin, and due to a chronic lymphangitis, cannot be altogether excluded.

FIG. 1.



Vertical section through the edge of the area of Paget's disease showing the lymphatics of the dermis permeated and distended by cancer cells derived from the subjacent carcinoma. (Magnification 63 times.)

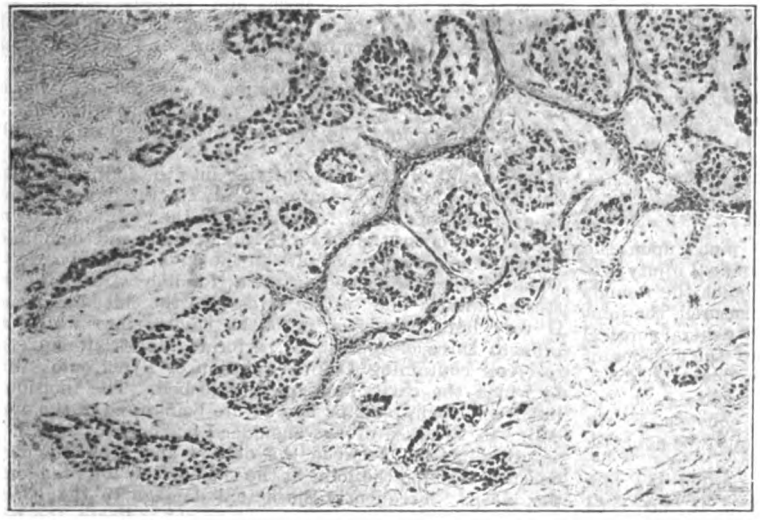
TREATMENT.

It is sometimes stated, and more often thought, that pathology is no occupation for a serious-minded surgeon. If this is true no sportsman should study the habits of his game. Disease is the surgeon's quarry, but he should walk it up casually by clinical observation or get it driven by pathological beaters. The history of the treatment of Paget's eczema supplies a criticism of this theory. Even so distinguished a man as Sir James Paget, led astray by superficial appearances and confessedly ignorant of its pathology, advocated a radically unsound method of treating the disease which he described so well. He advised free excision of the eczematous area of the nipple, a natural step to take if the eczema were in truth the precursor and cause of the cancer. He admitted his want of success in preventing the development of cancer.

Though, as the result of Thin's work, opinion has gradually turned in favour of treating such cases as ordinary carcinomata, a remaining doubt has often led to a dangerous delay and to the adoption of half-hearted measures. If it is once generally admitted that Paget's eczema is not the possible cause of a future carcinoma of the breast, but the result of an existing one—if, moreover, it is accepted as evidence that the growth has already widely permeated the breast—even though no palpable lump can be felt in it—then there will be no excuse for dilatory methods.

The right treatment for Paget's disease is the usual complete operation for cancer of the breast. It is my impression that duct-carcinoma, the form of disease connected with Paget's disease, has a rather more favourable prognosis than carcinoma of the breast in general, and that it affects the axillary glands rather late. Surgeon-General Lenthal Cheatle tells me that, in his opinion, the post-operative prognosis of Paget's disease with carcinoma is a favourable one. The disease is so rare that statistics on the point are not available.

FIG. 2.



Horizontal section through the apices of the papillæ in the area of Paget's disease. Each papilla shows a central lymphatic permeated by cancer cells. (Magnification 110 times.)

CONCLUSION.

It has been said that the ultimate test of a theory is its fruitfulness. I may be permitted a certain satisfaction if—as I believe this lecture shows—the permeation theory of dissemination has emerged successfully from this final test.

I have to thank Dr. Browning, director of the Bland-Sutton Institute of Pathology at the Middlesex Hospital, for his kindness in placing the resources of the laboratories at my disposal for the purposes of this lecture, and for his suggestions as to methods of lymphatic injection. Surgeon-General Cheatle has kindly allowed me to use his histological specimens.

In conclusion, Sir, may I take this opportunity of thanking you, as representing this College, for the unsought recognition of my work implied in the recent grant to me of the quinquennial Walker prize for cancer research, an encouragement which has led me to present to you my views on Paget's disease.

THE TREATMENT OF

SEVERE INFECTED GUNSHOT INJURIES OF THE SHOULDER AND ELBOW JOINTS;

EARLY EXCISION TO SECURE MOBILITY.*

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THE treatment of gunshot injuries to important joints, complicated by extensive comminution of the articular surfaces and by septic infection, has received considerable attention, particularly in regard to the knee-joint, where the anatomical conformation of the synovial membrane offers such difficulty in securing adequate drainage. In a large number of severe injuries of the knee the best that can be hoped for, short of amputation, is an ankylosed joint, and the patient is left with a good prospect of earning his living. A fixed shoulder or elbow, however, causes much greater physical disability as far as the earning capacity of the individual is concerned, and it is with the object of obtaining a movable and useful joint that I have adopted a method of early excision of the joint with such satisfactory results that I am tempted to put them together, with the hope that they may prove of assistance to others.

The ultimate results obtained in the earlier period of the war after extensive injuries of both the shoulder and elbow joints were by no means satisfactory, drainage of the joint resulting in fixation of the articular surfaces, whilst sinus formation from necrosing fragments of bone often necessitated further operative measures before healing was obtained. Fixation of the shoulder, with inability to abduct, flex, extend, or rotate the arm, is a serious disability, whilst in the elbow any fixation at an angle about 80° renders the arm useless for feeding, whereas an elbow fixed at this angle is of very limited use for mechanical purposes. In my earlier cases I considered it advisable to leave the joint alone after free drainage and removal of any obviously loose fragments of bone until firm healing was obtained and then proceeded to a formal excision of the joint, but I found so much matting and infiltration of the ligaments, muscles, and structures in immediate relation to the joint from the previous septic inflammation, that not only was the operation rendered difficult, but the results obtained were not satisfactory. In addition, the time occupied in the healing of the original wounds, the liability to localised necrosis requiring local operations, and the pain experienced were a severe tax on the patient's strength, and he was often inclined to refuse further operative procedure.

In reviewing a large number of cases of gunshot wounds of the shoulder and elbow joints they may be roughly classified as: (1) Penetrating wounds without fracture or sepsis; (2) penetrating wounds without fracture but with sepsis; (3) fracture of the articular surfaces without sepsis; and (4) fracture of the articular surfaces with sepsis.

Each of these classes may be further complicated by the presence of a bullet or metal fragment, either embedded in the ends of the bone, in the joint, or in the tissue surrounding the joint. In the majority of cases the bullet or fragment conveys infection with it from particles of earth or clothing accompanying it, and the question of removal must be decided upon in each individual case from the amount of trouble caused.

The treatment of the joint depends as much upon the degree of sepsis arising as upon the anatomical injury produced. Where no sepsis is present in the joint the wounds of entry and exit may be excised but not sutured, the joint fixed on some suitable splint and treated on general surgical lines. Personally I must say that I regard the excision of primary gunshot wounds of a limited or even doubtful advantage, and have seen many cases of bad results from this practice. Where septic infection has been conveyed to the interior of the joint more active measures must be adopted, and the joint cavity thoroughly irrigated.

I would here note the difficulty in determining the presence of septic infection within the joint. It has been frequently observed that the joint may be distended with pus containing streptococci, coliform organisms, and bacillus perfringens, but yet there is comparatively little pain, and the temperature and pulse-rate are only slightly raised—in fact, a very different clinical feature to the acute septic arthritis of civil practice. With a gunshot wound penetrating a joint, one may be tempted not to open the joint in the absence of constitutional disturbance, whereas delay where sepsis exists may make all the difference in the ultimate functional utility of the joint. An inflamed area around the entrance or exit wound, the discharge of thin mucoid fluid on pressure, commencing thickening of the tissues around the joint, a slight elevation of temperature and a commencing leucocytosis are indications of infection and of the necessity of exploration and irrigation.

It is, however, to cases of extensive bony injury to the articular surfaces, associated with a virulent infection, that I desire to draw attention. These injuries are so extensive and appear at first sight so hopeless that the limb may be amputated, whereas if saved at the expense of a prolonged convalescence after free drainage and the removal of necrosing fragments of bone, the resulting fixation of the injured joint is a source of great physical disability to the patient. The septic infiltration of the tissues surrounding the joint, together with the filling up of the actual fossæ in the bone around the joint by callus during the period in which the limb must be kept at rest, all tend to prevent mobility, whilst the erosion of the articular cartilage in the pathological processes leads to absolute bony fixation.

I was faced with this difficulty in a case of a young soldier whose right arm had been amputated immediately below the shoulder-joint, and whose left elbow-joint was extensively smashed and septic. In this case fixation of the elbow at such an angle as to allow him to feed himself would have left him with an arm of little use for any other purposes, whilst fixation at 120°-150°, to give him the greatest mechanical advantage in the limb, would have rendered it useless for feeding. After much consideration I decided to freely excise the damaged elbow-joint, even in the presence of marked sepsis, leaving the cavity freely open, and after three months this patient could flex and extend his elbow to a range of nearly 90°, and had excellent muscular power in the arm—in fact, he surprised us by lifting and flexing the elbow whilst holding a heavy scuttle of coals. This case gave me much food for reflection, and I have since adopted the principle which I now advocate—namely, free and early excision in cases involving severe comminuted fracture of the articular surfaces of bone, complicated by septic infection with the direct object of obtaining a movable joint.

The Treatment Adopted.

Cases are received at Woolwich at varying periods from the date of injury, but it is no uncommon thing for them to arrive within three days of being wounded. In all septic cases I make a routine practice of giving an injection of a mixed polyvalent streptococcus and proteus vaccine, as I have described elsewhere,[1] and the wounded area is carefully skiagraphed to determine the nature and extent of any bony injury and the presence of metal fragments. I consider this preliminary injection of "antisepsis" vaccine of as much importance as the prophylactic injections of antitetanic serum, as by its means the spread of anaerobic infection is limited.

If the ends of the bone entering into the formation of the shoulder or elbow joint are severely fractured and if there is evidence of septic infection in the joint, I do not hesitate to open the latter freely, remove all completely detached fragments, and saw off the ends of the bone; the whole cavity is flushed with a forcible stream of hot sterile water, and after arresting the bleeding gauze is very lightly inserted into the cavity, into which are brought three or four small perforated tubes attached to a reservoir containing Dakin's solution or hypertonic saline, by which the cavity is frequently flushed. The incision is left freely open, perhaps one suture being used at the upper end. In the case of the shoulder I make use of an oblique anterior incision between the deltoid and pectoralis major muscles, opening the joint at the side of the long tendon of the biceps. Frequently the actual damage to the bone is more severe than the radiograph would indicate, the head may be completely separated from the neck and displaced.

* A paper read before the Surgical Section of the Royal Society of Medicine, March 14th, 1917.

[1] THE LANCET, 1916, ii., 859.

If possible, the tuberosities and rotator tendons are left intact, but if the fracture involves the tuberosities they are removed, the periosteum being stripped from the upper part of the shaft and the bone divided through the surgical neck. A stab incision is then made from the posterior aspect of the joint backwards to come out behind the shoulder, or the bullet track used if conveniently placed and a drainage-tube inserted, the flushing tubes being introduced by the anterior incision. The arm is then fixed in a fully abducted and slightly flexed position, and in my later cases I have made use of a special splint I have had made for me by Messrs. Allen and Hanbury for both these cases and for gunshot fractures of the upper third of the humerus, in the latter extension being maintained from the flexed elbow. The arm rests very comfortably in this splint, the wound can be easily dressed without removing it, and the patient is able to be up and walk about; the deltoid muscle is maintained relaxed and does not show the same degree of wasting as when the arm is fixed to the side.

In the elbow I use a free, median, posterior incision, separating the tissues close to the bone and as far as possible preserving the triceps tendinous attachment, and, of course, the ulnar nerve. The lower end of the humerus is projected from the wound and removed as may be found necessary, usually above the epicondylar line. The olecranon is removed together with the upper cartilaginous surface of the coronoid process and the cupped disc of the head of the radius. The cavity is then flushed with hot sterile water, lightly filled with gauze, and the irrigation-tubes introduced. The arm is put up, flexed, and supinated, the wound being left freely open. After a few days, when granulations appear on the surface, passive movements are commenced and the forearm put up in a different angle of extension each day. As the wound fills up voluntary actions are encouraged.

In two cases of severe fracture into the elbow I have been content with the removal of the fractured humeral condyle, leaving the olecranon and radius untouched. In each case the internal condyle and trochlear surface was removed at an early stage and the joint treated as in a complete excision. At the operation cultures are taken from the interior of the joint and a full bacteriological examination made, from which specific autogenous vaccines are prepared and given at intervals of four or five days, under the direction of my colleague, Dr. Kenneth Goadby, who will detail the bacteriology of the cases.

It might be noted here that the bacteriological findings in these cases show the presence of not only pyogenic cocci and bacilli of the coli group, but also bacillus perfringens of malignant œdema and *Hibler IX.* The operations in practically all the cases were done in the presence of active and virulent sepsis, but by treatment with free drainage, irrigation, and vaccines the sepsis was at once controlled. There is usually a slight elevation of temperature for a few days after operation, but it soon settles down, and in only one case have I had to incise the limb after the operation for any spread of sepsis.

Results.

So far I have operated in an early stage upon six cases for excision of the shoulder-joint, and on eight for excision of the elbow-joint in cases of severe comminution of the articular surfaces associated with sepsis.

Shoulder-joint cases.—One remains in hospital, but it is doing well; of the remaining five, in one a sinus remained after 17 weeks due to the necrosis of some small fragments which were removed. Of these five cases the ultimate result was good in two, free movement of flexion and extension and abduction without scapular movement to an angle from 50° to 60° with the vertical being obtained. In two other cases the result was fair flexion and extension being good, but abduction was limited to 40° with the vertical, whilst in the remaining one there was evidence of circumflex nerve injury from the primary wound which persisted, so that abduction was impossible owing to the paralysis of the deltoid, and the patient refused further operative treatment to deal with the nerve lesion. It is interesting to note that in cases of excision of the shoulder where extensive removal of the bone through the surgical neck was performed by subperiosteal resection, subsequent radiographs demonstrated that there was considerable reformation of bone in the line of the shaft of the humerus towards the glenoid cavity.

Elbow-joint cases.—Here the ultimate results have been even more satisfactory. Of the eight cases operated upon one is still in hospital from operation too recent to include as a result; of the remaining seven cases, one required further operation on the ninth day from spread of sepsis in the middle of the arm. Of these seven, in four the ultimate result exceeded all my expectations, flexion and extension being possible to almost full extent and supination and pronation being possible, but not perfect; all show some degree of lateral mobility, but that does not interfere with the usefulness of the limb and the muscular power in the arm and forearm is excellent. In each of these four cases, flexion of the elbow is so good that the patient can voluntarily touch the shoulder of the same side, can fix a collar-stud at the back of the neck, and can touch the angle of the scapula of the opposite side; extension is in each possible to almost a straight line. Each one could lift and raise a fairly heavy ward chair with the elbow flexed and unaided. In two cases flexion and extension are possible in a smaller range, in one from 80° to 145°, and in the other from 80° to 120°, further movement being limited by masses of callus formed about the ends of the bone. In the latter case the operation for excision was performed at a later period after free drainage had proved ineffectual to arrest the infective processes. In the remaining case, in which the upper fourth of the radius had to be removed owing to excessive shattering, flexion and extension are possible in a range of 45°, but no movement of pronation or supination is allowed owing to the absolute fixation of the upper end of the radius to the ulna by a large mass of callus joining the two bones.

In addition to the above I have excised two hip-joints for extensive fracture of the head and neck of the femur with septic infection in the joint. One case did well, and the patient walks with a limb shortened by 1¼ inches, but with good movement at the hip. The other case was doing well, but died suddenly on the thirteenth day from a profuse hæmorrhage from a chronic duodenal ulcer which opened the pancreatico-duodenal artery. So far I have had no opportunity of excising a knee-joint in a recent case of gunshot injury, but in the light of other joint cases and with my experience of the difficulty of adequately draining a septic knee-joint, I would not hesitate to do so, but in this instance with the distinct object of obtaining a firmly ankylosed joint.

I am of opinion that the earlier the operation of excision is performed the better is the chance of obtaining free mobility. In my cases the best results have followed operations performed soon after the injury. Naturally a very great deal of the success of the operation depends upon the assiduity of the after-treatment and the hearty coöperation of the patient in carrying out early movements, and I would here like to express my sincere thanks to the various medical officers who have had charge of these cases and who have so faithfully carried out my instructions.

Advantages of the Operation.

1. All loose fragments of bone and the articular surfaces are removed, having a clean sawn surface rather than jagged ends of bone.
2. Very free drainage is established, and the joint can be freely irrigated.
3. The septic processes are at once controlled and pain is much diminished. The chance of having to amputate for advancing sepsis is much lessened.
4. The time of convalescence is very much diminished and there is much less risk of localised necrosis of bone and sinus formation.
5. A movable joint is obtained with good muscular powers.

Objections to the Operation.

1. *Shock.*—There is necessarily more shock in an excision of a joint than in making free incisions for drainage, but actually the shock is very slight. The operation can be easily performed in half an hour, bleeding is easily controlled, and no large nerves are divided as in amputation. I have seen no necessity of amputation having to follow in any case from failure to control the sepsis, but, should it become necessary, the previous excision of the joint would probably increase the risk. There has been no instance of secondary hæmorrhage.
2. The fact that *freshly sawn surfaces of bone are exposed to septic infection* might seem to be a disadvantage, but with

the free drainage, intermittent flushing of the cavity, and the use of vaccines the risk of septic osteomyelitis appears to be small.

3. The risk of a *flail joint resulting*. This is a possibility which cannot be overlooked, especially in the elbow. I can only say that I have not seen it in my cases, and I have removed so much bone that three fingers could easily be placed between the sawn ends with the forearm extended, but I have seen one case in which the joint was flail after an excision of the elbow performed at a later stage.

4. The excessive formation of callus around the divided ends of the bone may limit free movement. In cases in which the comminution of bone is excessive, or where splinters or minute particles of bone are conveyed into the surrounding tissues, this formation seems to be more excessive and may limit free movement; but where movement is commenced early, and the patient steadily perseveres with it, good range of movement is obtained. In some cases it is surprising that such good movement is obtained where large masses of ossified callus surround the ends of the bone.

It may be justly urged on theoretical grounds that it is unjustifiable to remove so much bone in the presence of active and virulent sepsis, or that I am urging a procedure which contravenes ordinary surgical principles, but I can only point out the success that has attended these operations. I am conscious that the number of cases is small, but I have not included those in which the operation has been performed when the wounds were healed and the joint fixed or those in which the operation was done at a later stage when necrosis of the end of the bone had commenced. However, I feel most strongly that if in these cases of septic gunshot fractures involving the joint excision or partial excision were performed soon after the injury, we should be doing more for the wounded man in putting him into a better position to earn his future livelihood, would materially shorten his convalescence, and thus save the State not only much of the expenses during hospital treatment, but also the amounts paid in pensions.

I must thank Colonel R. J. S. Simpson, A.D.M.S., Woolwich, for permission to make use of the cases forming the basis of this communication, and my colleague, Dr. Martin Berry, for the excellent series of radiographs used in illustrating it.

Shoulder-joint Cases.

CASE 1.—Private B. Wounded Dec. 3rd, 1915. Bullet entered at back of left shoulder and passed out by a large wound in front. Operation in France; anterior wound incised and shoulder-joint opened. Jan. 3rd, 1916: Admitted to Woolwich. Free discharge from anterior wound, great pain on any movement of shoulder. Deltoid paralysed and circumflex anæsthesia. Skiagraph showed much comminution of head and neck of humerus; head of bone turned, so that articular surface faced outwards. Jan. 6th: Operation. Wound opened; upper end of humerus of dark-grey colour and articular cartilage removed. Periosteum separated and bone divided through surgical neck. Area flushed with hot saline and wound lightly packed with gauze with large drainage-tubes. Arm fixed abducted with extension from elbow. Jan. 19th: Wound granulating well. Temperature normal since operation. Arm fixed on Hey Groves crutch-splint. No pain in shoulder. Jan. 27th: General condition much improved. Feb. 14th: Wound healed. Passive movements are free, but patient will not make any attempt towards active movement. Deltoid paralysed. March 20th: Flexion and extension good. No abduction. Deltoid wasted. June 1st: Can flex and extend shoulder, but no abduction. Circumflex paralysis remains. Movements of elbow and hand good. Skiagraph showed large deposition of bone in line of shaft occupying position of piece removed. No necrosis or sequestrum seen.

CASE 2.—Private H. Wounded Dec. 12th, 1915, bullet entering at point of right shoulder and coming out in pectoral fold. Feb. 27th, 1916: Sinuses remain at each wound and dead bone easily felt by probe. Free discharge of thick pus. Skiagraph showed disorganisation of head of humerus; articular surface pointed upwards. Rarefied area in neck, probably necrotic. March 4th: Operation. Much disorganisation found in shoulder-joint, the head of humerus being blackened and soft necrotic area below it. Tuberosities not involved. Section made through anatomical neck and necrotic area thoroughly scraped. Cavity flushed out. Free drainage. Arm fixed in abducted position. March 24th: Slight pyrexia for first week. Wound closing rapidly. Passive movements commenced. April 20th: Wound healed. Moves shoulder a little. July 13th: Can flex and extend arm and abduct to 40°. Deltoid acts well. No rotation in shoulder, but movements are increasing.

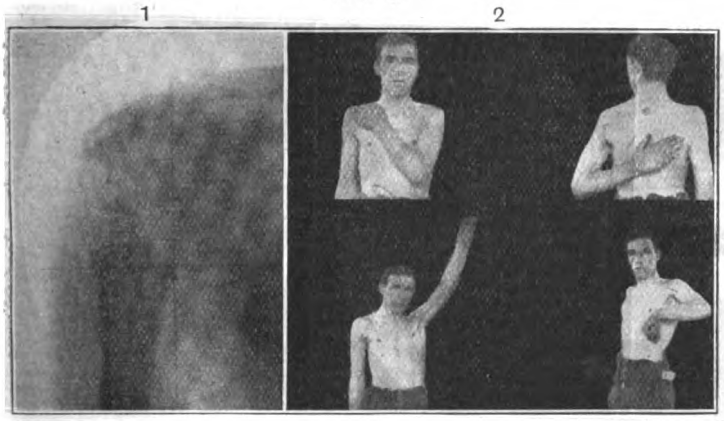
CASE 3.—Corporal G. Wounded Jan. 24th, 1916, bullet passing through right shoulder. Two operations in France where shoulder-joint opened and drained. March 17th: Two healed wounds on outer aspect of shoulder and large open wounds both in front and behind, through which a drainage-tube passes. Great pain in any movement. No paralysis of arm. Skiagraph showed extensive comminution of upper end of humerus, the head being completely separated from the shaft, the drainage-tube passing in interval. Upper end of shaft necrotic. March 28th: Operation. Anterior opening enlarged and joint opened. Head of humerus very necrosed and devoid of articular cartilage. Upper end of shaft also necrosed. Periosteum separated and shaft divided through surgical neck, 1½ inches being removed. Granulations scraped away and bleeding arrested by hot saline. Cavity irrigated with hydrogen peroxide, large drainage-tube in posterior wound and small tubes for irrigation from front wound. Light pack of gauze in wound. April 2nd: Very little discharge and granulations appearing. April 17th: Wound healthy, passive movements commenced. May 10th: Not much active movement in arm yet. July 15th: Very fair movement in shoulder, flexion and extension good, but abduction limited to 40°. Skiagraph showed a new formation of bone extending in line of shaft towards glenoid cavity.

CASE 4.—Private G. P. Wounded July 1st, bullet entering front of left shoulder 1½ inches outside tip of coracoid process and emerging at slightly lower level behind. Admitted July 5th, when a radiograph showed fracture of the clavicle, of the acromion process, and of the anatomical neck of the humerus, the head of the latter being comminuted and displaced. July 6th: Wounds opened and free drainage established through joint. July 27th: Temperature raised for last three days and local swelling about shoulder. Wound opened and head of humerus found blackened and necrosed. Decided to excise head; periosteum peeled back and muscular attachments to tuberosities detached. Resection through upper part of surgical neck. Joint cavity flushed with hydrogen peroxide and saline and freely drained by posterior incision. Intermittent flushing with Dakin's solution. Arm maintained abducted. Sept. 25th: Wounds all healed. Nov. 12th: Can voluntarily abduct arm to 45° from body, and on fixing scapula passive movement can be made to 80° before scapula rotates. Flexion and extension of arm good. Skiagraph showed a fair growth of callus around upper end of shaft. Glenoid irregularly thickened. Jan. 4th, 1917: Movements at shoulder are more free. Can abduct easily to 60° without rotation of scapula. Flexion and extension are more free. Result excellent. (See Figs. 1 and 2.)

CASE 5.—Private H. MacI. Wounded July 1st, 1916, by rifle bullet entering in front of right shoulder just outside tip of coracoid process and emerging in posterior deltoid margin. Admitted July 4th. Anterior wound sloughing. Thin, serous bubbly pus draining. Great pain in shoulder. No nerve injury. Skiagraph showed very comminuted fracture of head of humerus. Articular surface rotated. July 6th: Operation. Incision in pectoro-deltoid interval, joint opened. Head of humerus much comminuted. Upper end of shaft black and necrotic. Periosteum stripped off tuberosities and detached bone and upper end of shaft removed. Area flushed with peroxide and hot saline and cavity lightly packed with gauze. Large drainage-tube through posterior wound. Arm put up fully abducted and arranged for frequent flushing. July 9th: Temperature about 100° F. Wound clean and commencing granulation. July 20th: Wound excellent. Very little discharge. August 22nd: Arm removed from splint and passive movements commenced in shoulder. Wound almost healed. Nov. 11th: Small sinus remained in incision and skiagraph showed small sequestra at upper divided end of humerus. Can move shoulder surprisingly well. Can abduct to 45° without movement of scapula. Nov. 13th: Sequestra removed. Jan. 10th, 1917: Wound healed. Movements of arm increased. Can abduct to 60° and flex and extend well. Can passively raise arm to almost vertical. Result is very good. (See Figs. 3, 4, and 5.)

CASE 6.—Corporal E. Wounded July 29th, 1916, by shell fragment entering posterior aspect of left shoulder and emerging at tip of coracoid process. Admitted August 3rd. Patient sallow and sweating. Temperature 98° F. Pulse 112. Wounds foul and fine crepitation felt around anterior aspect of shoulder. Skiagraph showed great comminution of head of humerus, which is separated from shaft. Glenoid cavity and neck of scapula comminuted. Fracture of coracoid process and spine of scapula. Three fairly large metallic fragments present. Operation (on admission): Wound freely opened and direct communication made from front to back through joint. Bone very comminuted and very foul. Smear preparations showed numerous spore-forming bacilli. Area swabbed with peroxide and tubes arranged for continuous

CASE 4.

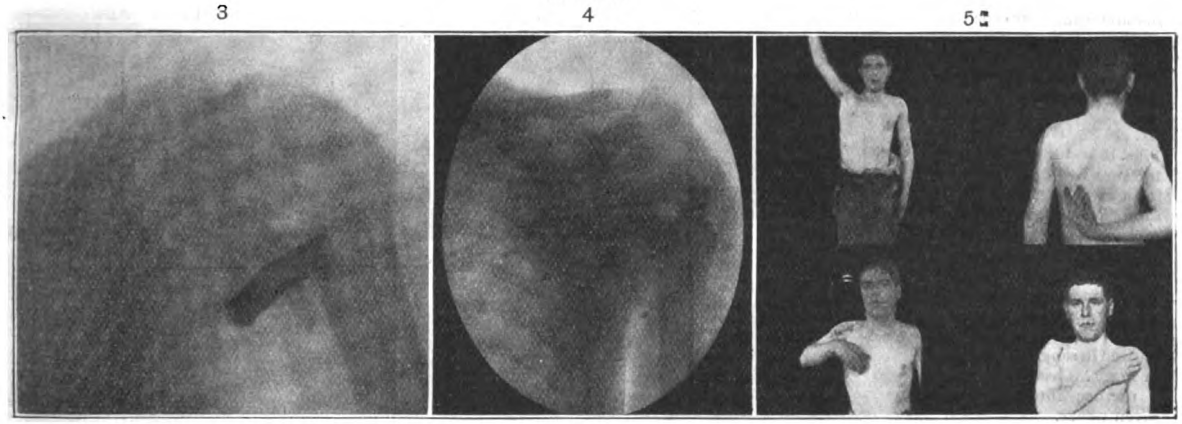


FIGS. 1 and 2 (Case 4).—Fig. 1, radiograph taken three and a half months after excision of shoulder, shows the ossification of callus at the upper end of shaft of humerus. Fig. 2 shows the movements obtained; note that the figure showing elevation of the arm is a passive movement, the others active and voluntary.

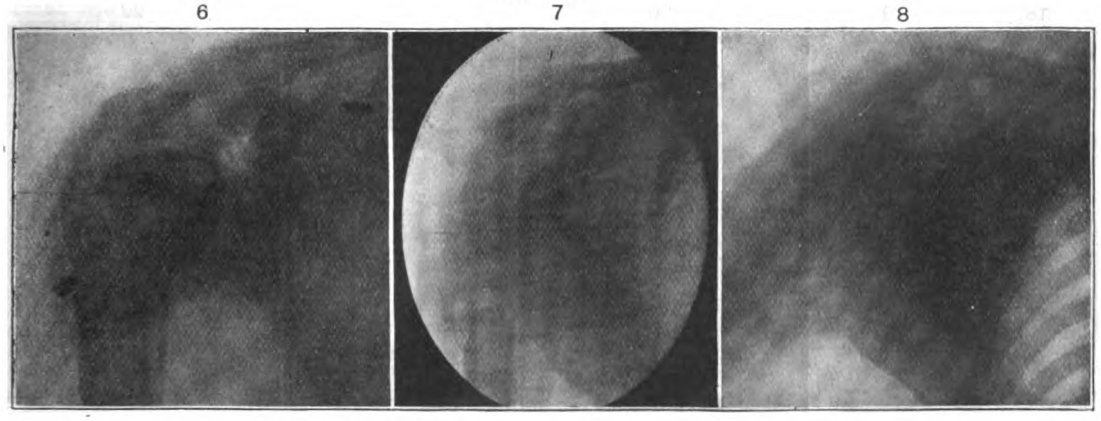
FIGS. 3, 4, and 5 (Case 5).—Fig. 3 is a radiograph of the original injury to the head of the humerus with drainage-tube *in situ* (July 4th). Fig. 4, radiograph four months after excision. Fig. 5, the movements obtained; note that the elevation of the arm is a passive movement, the others active movements.

FIGS. 6, 7, and 8 (Case 6).—Fig. 6 shows the injury to humerus, scapula, and clavicle five days after the receipt of wounds, the central clear area being a gaseous collection in anaerobic infection. Figs. 7 and 8 are radiographs taken two months after excision showing the movement of the mass of callus with the humerus.

CASE 5.



CASE 6

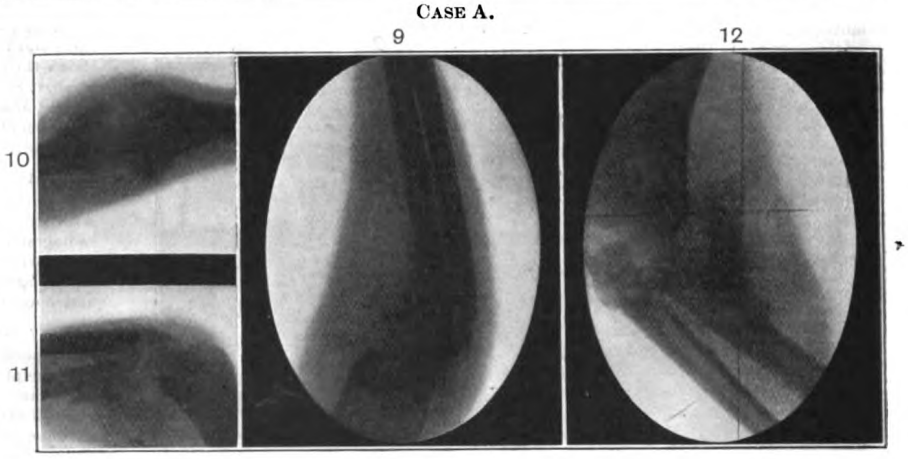


irrigation. Saline infusion. August 6th: General condition good. Temperature 98·6° F. Pulse 96. Tongue clean. August 14th: Condition unsatisfactory. Temperature up to 102° in evenings, but tongue moist. Drainage not so free. August 15th: Operation. Wounds freely opened. Bone found blackened and very foul. Much comminution. Purulent granulations in medullary cavity of shaft. Latter sawn through surgical neck. Glenoid cavity only held by triceps attachment and was removed, and many rough pieces of bone removed with forceps. Area flushed with saline and hydrogen peroxide and freely drained. Arranged for continuous irrigation and arm put up abducted. August 21st: Temperature normal since operation. August 30th: Doing well. Arm maintained abducted to 60°. Sept. 20th: Anterior wound healing well. Oct. 20th: Skiagraph showed a lot of callus around upper end of humerus which moves with shaft. Sequestra present at glenoid and upper end of shaft. Dec. 30th: Sinuses remain at each end of incision. Jan. 9th, 1917: Sinuses opened and sequestra removed. There is a small amount of mobility at shoulder, and deltoid muscle acts. Patient remains under treatment. (See Figs. 6, 7, and 8.)

Elbow-Joint Cases.

CASE A.—Private O. Wounded May 28th, 1915, by shell explosion in close proximity, causing extensive wounds in right arm and about left elbow. Was operated upon within two hours and right arm amputated immediately below shoulder-joint. Admitted June 5th. Amputation stump very septic, wound extending into posterior axillary fold. Also septic wound of upper left forearm over olecranon. Skiagraph: Complete shattering of upper 2 inches of both radius and ulna; very comminuted. No fracture of humerus. Large metallic fragment 3 inches above joint. June 8th: General condition bad. Pulse 120. Saline enemata. Wound of forearm opened for drainage and fragment removed. June 14th: Operation. Vertical median posterior incision and triceps

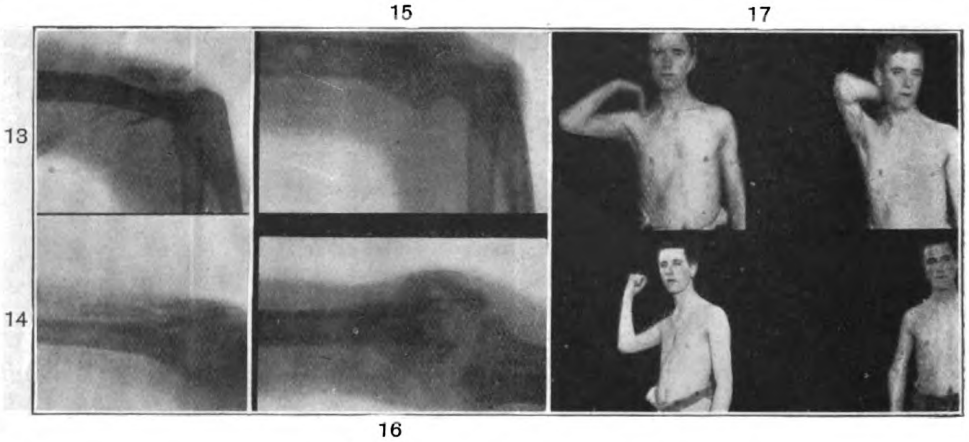
CASE A.



FIGS. 9, 10, 11, and 12 (Case A).—Fig. 9 shows the great comminution of upper ends of radius and ulna, with fragments of bone driven into tissues in front of joint. Figs. 10 and 11 show antero-posterior and lateral views of the joint six months after operation (Fig. 11 is upside down). Fig. 12, skiagraph after 18 months. The large mass of callus in front of joint limited range of movement to 60°, but flexion was allowed to a right angle.

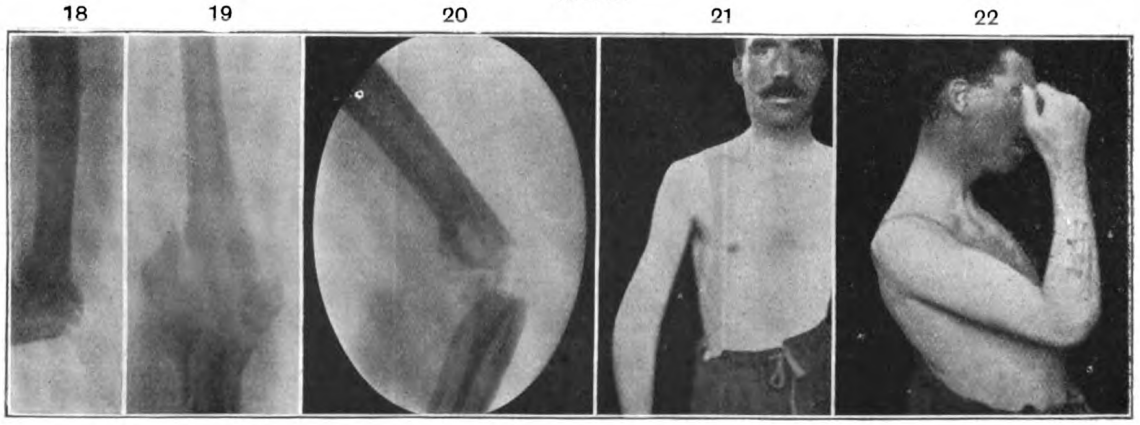
FIGS. 13–17 (Case E).—Figs. 13 and 14 are lateral and antero-posterior radiographs taken four days after injury. Figs. 15 and 16 are taken ten weeks after excision of elbow; note lateral formation of callus and slight internal displacement of forearm. Fig. 17 depicts the voluntary movement obtained.

CASE E.



FIGS. 18–22 (Case F).—Figs. 18 and 19 show the fracture five days after injury; note the comminution of lower end of humerus. Fig. 20, six weeks after excision. Figs. 21 and 22, voluntary movement six weeks after excision; these movements increased in range to those in Fig. 17 (Case E) after a further interval of seven weeks.

CASE F.



tendon detached. Detached fragments of bone removed and upper ends of radius and ulna sawn off just above the level of tubercle of radius. Humerus not sawn off. Area flushed with peroxide and cavity lightly packed. No sutures in wound. June 20th: Wound clean and granulating. July 2nd: Passive movements commenced in elbow. Can move fingers and hand well. August 2nd: Wound almost healed. Only a small range of movements allowed without pain. Jan. 31st, 1916: Can move elbow through a range of 80° and has very good muscular power. Can feed himself and touch back of occiput. There is a firm prominence in front of elbow. December: Elbow had improved until he was again injured by bomb explosion. Still has a range of movement of 60° and power is very good. Skiagraph showed large formation of callus about upper end of radius and ulna which prevents full flexion at elbow. (See Figs. 9, 10, 11, and 12.)

CASE B.—Private E. M. Wounded Sept. 25th, 1915. Wound in upper left forearm, involving median nerve, and also in inner aspect of right elbow-joint. Admitted Oct. 14th, when there was great pain in right elbow, tense swelling around the joint, and a thick purulent discharge from the wounds. Temperature 103·4°F. Skiagraph showed shattering of lower end of right humerus. No fracture of ulna or radius. Oct. 15th: Operation. Wounds of right elbow opened and found to pass directly into elbow-joint, the inner part of which was destroyed. Completely detached fragments of bone were removed, including the whole of inner condyle and supracondylar ridge and the trochlear surface of humerus. Capitellar surface was intact. Rough bone edges were rounded off and cavity flushed with hot saline and with peroxide. Wound very lightly filled with gauze. Arm put up on right-angle anterior splint. The operation wound very quickly cleaned up and granulated. Jan. 1st, 1916: Wound healed and movements of elbow are good. Jan. 27th: Can voluntarily move elbow from 80° to 160°. The ulna has become slightly displaced inward as the result of the removal of the inner half of humeral articulation, but movement and muscular power are quite good.

CASE C.—Private M. Wounded Sept. 25th, 1915, in left forearm, fracturing radius in upper third and also on inner aspect of right elbow-joint. Arrived Oct. 15th. From the wound of right elbow there was a profuse purulent discharge; it was much swollen, extremely painful, and temperature 103° F. Skiagraph showed an extensive comminution of lower end of humerus into elbow-joint. Radius and ulna were intact. Oct. 16th: Operation. Wounds opened and passed directly into elbow-joint; the inner condyle of humerus was shattered. All loose bone removed, including the whole of trochlear surface of humerus, internal condyle, and part of the internal supracondylar ridge. The capitellar surface was left, together with the olecranon and head of the radius, which were not fractured. All rough edges of bone chipped away, cavity flushed with hot sterilised water and hydrogen peroxide. Gauze lightly packed in and two small tubes passed in for intermittent flushing. Oct. 27th: Elbow maintained flexed. Wound clean and granulating. Nov. 23rd: Wound nearly healed. Passive movements in elbow good. Jan. 1st, 1916: Wound of elbow healed. Can flex voluntarily to 75° and extend to about 150°. June 27th: Movements of elbow from 70° to 150°. Muscular power is very good. Ulna is slightly displaced inward.

CASE D.—Sergeant S. Wounded April 21st, 1916, shell fragment striking on tip of olecranon of right arm. Operation in France, where large metal fragment and several pieces of bone removed. On admission on May 1st there was a rounded opening over point of olecranon where bare fragments were exposed. No exit wound. Elbow very painful, and there was undue mobility forward of joint. Temperature 99° F. Skiagraph showed whole of olecranon comminuted into small fragments. Fracture of lower end of humerus separating internal condyle and trochlear surface from rest of bone, extending into joint and displaced slightly forwards. May 6th: Operation. Vertical posterior incision through triceps. Many small fragments of olecranon removed and pus found in joint. Base of olecranon sawn through. Humeral fracture was in good position and so a complete excision was not performed. Counter opening made on outer side and tubes arranged for continuous irrigation. June 8th: Temperature gradually settled down. Very little movement allowed in elbow. July 6th: Has had a lot of pain in elbow and œdema around it. Temperature 99–100° F. July 8th: Operation. Incision reopened and lower end of humerus found to be necrotic. Further opening on inner side and joint irrigated. July 20th: Temperature 101° and much purulent discharge. Operation. Joint fully opened and cartilage found much eroded. Complete excision removing humerus above intercondylar line, base of olecranon, and head of radius. Light pack of gauze and small tubes for irrigation. August 1st: Doing well, wound clean. Temperature normal. August 30th: Wound healed. Can voluntarily flex elbow. Sept. 20th: Can flex and extend from 80° to 120°. Supination and pronation fair. Oct. 30th: Much improved. Can touch shoulder of same side. Supination and pronation improved. Muscular power good.

CASE E.—Private F. Wounded July 1st, 1916, by bullet entering outer and anterior aspect of right arm 2½ inches above elbow and out over external condyle. On admission, July 5th, both wounds were inflamed and surrounding tissues swollen. Great pain in moving elbow. Temperature 98·6° F. Skiagraph showed fracture of lower end of humerus, extending into joint. Much comminution, especially of external condyle. Radius and ulna intact. Several small pieces of bone in tissues in front and behind joint. July 9th: Elbow very painful. Temperature 99·6°. Leucocyte count 13,500. July 11th: Operation. Median vertical incision and pieces of bone removed from triceps. Joint freely opened and fracture found much more extensive than radiograph suggested, the whole of external condyle and capitellar surface and outer half of trochlear surface being completely detached, comminuted, and rotated outwards. Section of humerus made ¾ inch above upper limit of olecranon fossa and olecranon removed at base, leaving cartilage of coronoid process and head of radius intact, owing to the extent of removal necessary in humerus. Cavity flushed with hot water and upper part of incision and triceps sutured. Free opening left below and tubes put in for intermittent flushing. July 20th: Spread of sepsis in arm. Focus opened. July 24th: Temperature not raised since last operation. Passive movements commenced. Wounds clean. August 23rd: Wound almost closed. Voluntary movements increasing. Sept. 8th: Wound healed. Can flex elbow enough to feed himself and to light a cigarette. Sept. 20th: Can voluntarily flex to 80° and extend almost fully. Supination and pronation very good. December: Can flex to 75° and extend almost to straight line. Muscular power very good. Excellent result. (See Figs. 13, 14, 15, 16, and 17.)

CASE F.—Private A. M. Wounded July 29th, 1916, bullet entering over tip of right olecranon and emerging at side of inner mid-line of elbow-joint. On admission, August 3rd, there was much ecchymosis of arm and forearm and swelling around the elbow-joint. Wounds small and clean. Temperature 98·4° F. Movements of elbow painful. Skiagraph showed very extensive damage to lower end of humerus, both condyles being fractured from shaft into joint and separated by lower end of shaft. Olecranon process also fractured. August 6th: Joint more swollen. Temperature 99·8°. Leucocyte count 15,000. August 7th: Operation. Posterior wound excised. Vertical median posterior incision of joint opened. Olecranon found fractured, together with a large triangular piece of upper shaft of ulna, which was removed. Both humeral condyles detached and articular surface of humerus comminuted, the lower end of shaft impinging on ulna between the fractured condyles. The muscular attachments were separated from condyles and later removed and lower end of humerus sawn off. Olecranon and coronoid processes of ulna and head of radius removed. Area well flushed with hot water and bleeding arrested. Each end of wound sutured and large median opening left for irrigation tubes. August 14th: Temperature normal since operation. Very little discharge. Small drainage-tube only in cavity. August 21st: Wound granulating. Passive movements begun. Sept. 12th: Can voluntarily flex elbow to 90°. Sept. 29th: Movements increasing, but muscular power poor. Nov. 20th: Movements very much improved. Can easily touch shoulder of same side, back of neck, and scapula of left side. Can extend to practically straight line. Can supinate but cannot completely pronate. Some lateral movement in elbow. Muscular power good. An excellent result. (See Figs. 18, 19, 20, 21, and 22.)

CASE G.—Private E. A. Wounded Sept. 10th, 1916, bullet passing through upper and outer part of right forearm just below elbow-joint. Admitted Sept. 27th. Wounds dirty and swelling about upper arm. Great pain on any attempted movement of elbow. No nerve injury. Skiagraph showed a very comminuted fracture of head, neck, and upper shaft of radius. Many small pieces of bone driven into surrounding tissues. No fracture seen in ulna or humerus. With such a comminution of radius and with sepsis in the elbow-joint, I deemed it advisable to remove the upper end of radius and so ensure drainage and also to attempt to obtain mobility in the elbow. Sept. 29th: Operation. Vertical incision through posterior wound. Radial head found loose and in small pieces, the articular ligament being destroyed. Many completely separated pieces of bone were removed and the sharp upper end of shaft of radius cut off with forceps. The elbow and superior radio-ulnar joints were fully exposed and flushed with hot saline and with hydrogen peroxide. Area lightly packed with gauze with tubes for drainage. Oct. 20th: Wounds granulating well. Temperature normal. Dec. 14th: Wounds healed. Can voluntarily move elbow from 75° to 120°, and this will probably further improve. There is no movement of pronation or supination and a skiagraph shows a large mass of callus around the upper end of the radius, fixing it to ulna, which now shows a small linear fracture in same area. Probably the excessive formation of callus is due to the great comminution of bone forced into the tissues by the "explosive" force at the original injury.

CASE H.—Lieutenant P. P. Wounded Sept. 15th, 1916, by shell fragment on inner and posterior aspect of right elbow. Has had five operations in France, but does not know what was done. Admitted Nov. 14th, when arm and forearm fixed in a straight Thomas splint, with extension. There was a large granulating surface on inner and posterior aspect of right elbow and much loss of tissue. Complete ulnar anæsthesia and paralysis. Skiagraph showed internal condyle of humerus was missing and a fracture-line through humeral articular surface separating trochlear from capitellar surface. Olecranon was fractured at base and displaced, and there was much bone débris in tissues. Nov. 20th: Temperature has been raised and more swelling around joint. Wounds opened and articular surface found devoid of cartilage, roughened and eroded. Counter openings made for free drainage. Dec. 12th: Skiagraph showed necrosis was extending. Dec. 15th: Operation. Vertical median posterior incision. Olecranon removed. Humerus projected from wound and 1½ inches of lower end removed, but not up to limit of fracture-line on inner side. Upper end of ulna and radius was necrosed, and so removed by saw through base of coronoid process and head of radius. Bleeding arrested and area well flushed with hot water, and tubes arranged for intermittent flushing with Dakin's solution. There was 1½ inches interval between sawn surfaces when forearm extended. Dec. 20th: Temperature normal since operation. Wound flushed very frequently with Dakin's solution, alternating was hypertonic saline. Dec. 27th: Wound granulating rapidly. Temperature normal. Forearm fixed in different positions at daily dressing. Jan. 12th: Granulations flush with surface and much smaller. Can move elbow passively from 75° to 120° without pain. March 1st: Can voluntarily flex from 150° to 90°. Remains under treatment.

ON THE CULTIVATION OF THE MALARIAL PARASITE *IN VITRO*.*

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IN the course of an investigation during the months of September and October, 1916, of cases of pyrexia admitted to a casualty clearing station as N.Y.D. (not yet diagnosed), malaria, or jaundice, the usual methods of hæmoculture in bile-salt media and citrated broth were supplemented, in addition to the examination of blood films for malaria, by the employment of a medium consisting of citrated normal saline containing varying strengths of glucose. The object in view was the cultivation of the plasmodium in this medium. At first the strengths of glucose used were 2 and 5 per cent., and later two other strengths, 7·5 and 10 per cent., were tried. The strength of the sodium citrate in the medium was 1·5 per cent.

The cultivation of the parasite was attempted in every instance of 100 cases of pyrexia, comprising enteric group infections, 20; N.Y.D., 49; and malaria, 31. In this first series a marked increase in the number of parasites in the culture tubes was noted in 9 of the 31 cases of malaria. The present paper embodies the results obtained from 51 cases of clinical malaria examined by means of the following technique.

Technique.—Blood from a vein at the bend of the elbow was obtained either by direct puncture or by an all-glass syringe with large-bore needle. About 1 to 2 c.c. of blood was inoculated into 10 c.c. of the glucose medium. After thorough mixing the tubes were incubated at 40°C. for 20 to 24 hours. Both aerobic and anaerobic methods were employed. Films were made from the uppermost layer of corpuscles, after the supernatant fluid had been pipetted off. Stained by the Giemsa method and examined by oil-immersion lens. The control films of 51 cases showed:—

Malignant malaria (ring forms and crescents or crescents only)	18
Benign tertian	12
Quartan	1
Malaria, type undetermined	10
No malarial parasites	10

Culture.

	Increase of parasites.			Totals.	
	Marked.	Not marked.	Undetermined.	Positive.	Negative.
Malignant malaria	11	1	2	14	4
Benign tertian ...	0	0	1	1	12
Malaria, ? type ...	4	0	3	7	3
Films negative ...		2	1	5	5
	17	3	7	27	24

Evidence of increase of parasites.—Using this medium, a diluted plasma with the addition of dextrose, the characteristic form which can be recognised as a plasmodium is what is termed here the "dot" form. In size it is smaller than the fine ring, the nucleus staining as a bright-red dot and the protoplasm an intense blue, semilunar in shape. The appearance suggests the merozoite. Typical ring forms were infrequent. Although the "dot" form appears free in many of the films, yet in fortunate films they are seen to be intracorpuscular, and it is probable that in the spreading of the films the fragile envelope of the incubated red corpuscle is damaged. No comparative enumerations of parasites were attempted.

Remarks.—In 17 cases (all of which were undoubtedly malignant malaria) the terms "abundant," "very numerous," are employed to indicate the number of "dot" forms present. The mere words do not adequately convey to the mind the relative ease with which parasites are to be found in the films as compared with the original control film. Of 18 cases of malignant malaria investigated only 4 gave a completely negative result in culture. On the other hand, no increase of parasites could be demonstrated in 12 cases of benign tertian and in 1 of quartan infection. Of 10 cases of malaria of undetermined type the culture was negative in 3. A reference to this point in connexion with diagnosis and the presence of quinine in the serum will be made later. Of 10 cases, 9 of clinical malaria and 1 of jaundice, in which the control blood films after adequate examination were considered negative, "dot" forms were found in 5. In two instances they were abundant.

Our statement that no parasites were found was the result of prolonged examination of blood films. The whole question, however, of the number of parasites present in blood is dealt with in detail by Sir Ronald Ross in his text-book on the "Prevention of Malaria" (1911), but one sentence can be quoted from this work, as follows: "But for a broad general rule we may, I think, accept the principle (pending more exact researches) that if we cannot find the parasites after careful search their number is not usually sufficient to produce fever."

Interpretation of results.—Two interpretations of this apparent increase of parasites seem possible: (1) an actual increase in the number of parasites, and (2) an apparent increase due to a concentration effect. To take the latter explanation. As is well known, if citrated whole blood be centrifugalised or allowed to settle the leucocytes are found to occupy mainly the intermediate layer between the red blood cells and the supernatant fluid. And yet it is in this intermediate layer that the malarial parasites are found. To quote Bass[1]: "The parasites live at the top of the column of the precipitated cells in a layer varying in thickness from one-fiftieth to one-twentieth of an inch. All parasites beneath this layer die in from 2 to 20 hours; the time is dependent on factors which we have not determined." The same author has shown that the consistency of the protoplasm of the malarial plasmodium is less yielding than that of the red blood corpuscle. "Large æstivo-autumnal plasmodia are round or oval, the tertian variety are more or less flattened." Such differences in the physical characters of the infected red corpuscles may determine in part the zone the living plasmodium occupies—namely, the intermediate layer. It may be, therefore, that this technique is of value in concentrating in this layer the infected corpuscles.

The alternative explanation is that an actual increase in the number of parasites has occurred—that is, the parasites have multiplied. If increase in the number of parasites indicates actual development, then segmentation of a mature schizont must have taken place in the culture-tube during the 20 to 24 hours' incubation. As only merozoite forms were found in the cultures, and, moreover, no further progress in the life-cycle followed a further incubation, it is manifest that this method allowed of the development for only a portion of the asexual cycle, in contradistinction to Bass's method, which permits of the cultivation of the parasite throughout one, or more than one, generation. In our experiments further incubation produced a gradual diminution in the number of parasites seen in the films. It is admitted that the possibilities of this technique are confined to aiding clinical diagnosis.

Blood incubated in citrated broth, but without the addition of dextrose, did not permit of the development of the "dot" forms in the culture tubes. The citrated plasma medium with dextrose may be said to permit of concentration of, and life of, the plasmodium for a period of 24 hours or more, while with Bass's medium the patient's serum with dextrose permits of concentration plus life plus development of the plasmodium.

Whether the true explanation of the results is an apparent or a real increase of parasites in the intermediate layer or both the evidence permits of no dogmatic opinion.

Conditions of growth.—The favourable conditions of growth are three:—

1. The presence of dextrose in the medium, as already stated, is essential. Bass and Johns,[1] in October, 1912, published their discovery of this important factor. Further, they found that maltose alone of many carbohydrates tried—e.g., saccharose, lactose, galactose, dextrine, mannite—could replace dextrose.

The percentage of sugar in normal blood is about 0·1 per cent. It has been shown by Maclean[3] that when normal blood is incubated for four hours at 37° C. active glycolysis occurs owing to the action of the leucocytes. Further, Maclean has shown that normal blood is capable of glyco-

* A paper read before the Salonika Medical Society on Feb. 14th, 1917

lysis whether or not sugar is added. He gives "0·4 per cent. or so" as about the maximum of sugar met with in diabetic blood, and records an experiment with normal blood to which glucose had been added, so that the total amount was 0·358 per cent., while after three hours' incubation at 37° C. the glucose was estimated at 0·281 per cent. This is a distinct reduction, but on the lines of our experiments with amounts such as 2·5 and 10 per cent. of added glucose it indicates that much of the added glucose is unaffected. Accordingly, in our experiments dextrose was added to the medium in quantities sufficient to obviate this diminution in dextrose content by the leucocytes. Strengths of dextrose varying from 2 per cent. to 10 per cent. were tried and the best results obtained in the 5 and 7·5 per cent. solution. At variance with this conclusion is the recommendation of Bass, as to the strength of dextrose, in his second publication. Bass using undiluted human serum as the culture medium added dextrose in such quantity that the final mixture contained 0·5 per cent. dextrose. The successful results obtained by Bass and Johns have been confirmed.

2. Bass in his original paper emphasised the importance of strict *anaerobiosis*, but in the second publication the technique recommended does not necessitate anaerobic cultivation. Whether the employment of glucose in the medium secures anaerobiosis or no, certain it is that, using both anaerobic and aerobic methods, we achieved precisely the same results. The red corpuscles by reason of their avidity for oxygen seem to remove the oxygen from the fluid medium and so contribute to the maintenance of an anaerobic state.

3. The optimum *temperature* is given as 40° C. Bass noted the segmentation of æstivo-autumnal parasites from the smallest rings in about 30 hours at 40° C., and that the parasite will develop, but more slowly, at any temperature between 37° and 40° C. In this series all cultures were incubated at 40° C.

Attempts to cultivate the benign tertian parasite, as already noted, have with this technique so far met with no success. How different is the case of the malignant parasite which can live and develop partially in an unfavourable culture medium! Now, as Bass has grown the three malarial parasites, a comparison of the two methods, based as yet on a small number of cases, is fitting.

The literature of this subject, which was not even available at the outset of these investigations, is limited to two papers. Bass and Johns [1] have recorded that they successfully cultivated the æstivo-autumnal parasite from each of 29 different patients and the benign tertian parasite six times. One case of quartan was tested, but the parasites failed to grow. The lack of success was ascribed to certain errors of technique: "It is to be remembered that one of us (Bass [3]) obtained growth of the quartan parasite in his earlier work."

Thomson and McLellan,[4] employing Bass's method but incubating at the lower temperature of 38° C., were able to cultivate the malignant parasite from two patients. The development of the plasmodium through one generation was followed. Sir Ronald Ross was convinced, after examining the preparations of Bass and Thomson and McLellan, that the evidence of the successful cultivation of plasmodium falciparum up to the sporulating forms was indisputable.

Bass's original technique.—One-tenth of a cubic centimetre of a 50 per cent. dextrose solution (Merck's) for each 10 cubic centimetres of blood to be taken is placed in the defibrinating tube before the blood is drawn. Defibrination is effected by gently stirring or whipping with the rod which extends through the wool plug. The whipping in of air, causing bubbles, must be avoided. The defibrinated dextrose blood, sufficient in amount to ensure of a depth of serum one-half to one inch above the red cells when the latter have settled, is transferred to two culture tubes and incubated at 40° C. The parasites may be examined at any interval by drawing a small quantity of cells from the intermediate layer by means of a capillary tube. Fine capillary tubes should not be used as the infected red cells may be damaged. Great care must be taken in handling tubes to keep them in the upright position. To defibrinate the blood we used a bundle of stiff wire twigs attached to a glass rod extending through the wool plug.

Remarks.—The material at our disposal during the last six weeks has been principally the benign tertian parasite. Nine cases have been examined by Bass's method, four of which have given a completely negative result. These latter cases had received doses of quinine in liquid form of 20, 40, 20, 20 grains respectively. In two instances the control film at the time of hæmoculture was negative. The five patients from whom positive cultures were obtained had received respectively the following amounts of quinine—0, 0, 5, 15, 10 grains. The parasite developed typically for 15, 45, 18, 17, 12 hours. Increase in the number of parasites, as judged by a comparison of the control film with the culture film, was noted in three instances. In the remaining two positive results the parasites were plentiful. Development up to segmentation was seen in two cultures.

Employing the citrated plasma medium, negative results were obtained in six cases of benign tertian infection. One case of quartan malaria continued its development up to the formation of merozoites. Increase of parasites was noted. Three other negative results were recorded. In two the control films showed a few crescents but no ring forms. In the third case there were a few fine ring forms. This patient had been given 40 grains of quinine during the preceding 24 hours. The remaining positive result is of interest. The patient had been taking 10 grains of quinine daily in tabloid form since leaving hospital in September, 1916. The control film showed scanty fine ring parasites with nucleus and vacuole but no crescents. Development was followed for 38 hours with the appearance of the malignant parasite in culture. The number of parasites was much increased, and there was a tendency, as noted by others, for the parasites to collect in groups. In the citrated plasma medium numerous "dot" forms were found at 24 hours. Fine ring forms were also seen.

The influence of quinine in culture.—It seems certain that the presence of quinine in the serum used in the culture medium influences the development of the plasmodium, the benign tertian parasite especially, *in vitro*.

In the living body a marked diminution in the number of benign tertian parasites from the peripheral blood within 12 to 24 hours of the giving of quinine in doses of 15 to 20 grains is observed commonly. Quinine given in fluid form by the mouth can be demonstrated in the urine after half-an-hour's interval, and by the end of 48 hours the greater part has been excreted chiefly by the urine and to a less extent by the sweat and bile. Clearly, then, the actual serum used for the culture medium will, if the drug has been administered recently, contain a certain amount of quinine.

The exact manner in which quinine exerts its destructive influence is still largely a matter of speculation. Thomson and McLellan [4] noted incomplete segmentation of the æstivo-autumnal parasite obtained from a patient who had been taking 5 grains habitually. A parasite of the same species recovered from another patient who had not taken quinine grew abundantly. Bass does not mention the influence of quinine in his cultures.

Summary.

The material embodied in the first portion of this paper, based on 51 cases, is probably large enough to admit of certain statements. Cases of clinical malaria in which the blood films were negative have been confirmed by cultural methods. Of 10 patients whose control blood films after careful examination were considered as negative, "dot" forms were found in five cultures. The two tertian parasites behave differently in culture. Of 19 cases of malignant malaria, 4 only gave completely negative results in the citrate plasma medium, while 17 cases of the benign tertian parasite failed to grow under the same conditions. As a corollary of this, where film examinations are inconclusive as to the type of parasite, a positive culture in this medium points to malignant infection. The employment of this medium as a routine in hæmoculture may prove to be of value in assisting and confirming a clinical diagnosis.

If with improvement of technique on the lines of Bass's method the cultivation of all three varieties of the malarial parasite can be made certain and permit of exact study, a step will have been made towards solving some of the many problems of malaria awaiting solution.

References.—1. Bass, C. C., and Foster M. Johns: Jour. of Exp. Med. October, 1912, xvi., 567. 2. Maclean, H.: Glycolysis in Diabetic Blood, with a Method for the Estimation of Blood Sugar, Journ. Physiology, vol. l., No. 3. Feb. 29th, 1916; and further papers in the Journ. Biol. Chem. 3. Bass, C. C.: Jour. Am. Med. Assn., 1911, lvii., 1534. 4. Thomson, J. G., and McLellan, S. W.: Ann. Trop. Med. and Parasit., December, 1912, vi., 449.

TETANUS AND ITS ANTITOXIN.

WITH AN ILLUSTRATIVE CASE.

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WHEN the medical history of the present war comes to be written one of its most interesting features will undoubtedly be that section relating to the incidence of tetanus amongst the wounded from the various fronts, and recording the success which has attended its preventive and curative treatment.

From a comparatively early stage of hostilities in France antitetanic serum has been in use throughout the British Expeditionary Force for all wounds likely to have become contaminated, subcutaneous or intramuscular injections being given as early as possible and repeated as circumstances seemed to indicate. How far this measure is to be regarded as having contributed to the saving of life and suffering will be definitely ascertained when full statistics have been tabulated. That a large amount of success is to be attributed to this *prophylactic* measure is already admitted by all who have had the opportunity of studying cases of the disease brought from the seat of war to the military hospitals in this country. To what extent tetanus antitoxin is to be recommended as a *curative* agent is a question which will also, doubtless, be largely elucidated by the teachings of the present war.

The following case, which resulted in recovery, is typical of many met with in the home hospitals during the war, and also presents some interesting pathological features.

On July 1st, 1916, in the attack on Montauban, Lance-Corporal —— was wounded on the right shoulder by two fragments of shrapnel. No dressing till next morning, when a piece of metal and piece of khaki were removed from the larger wound. Antitetanic injection given, and a second injection next day at Boulogne.

On July 10th, on admission to Milton Hill Hospital, Berkshire, the patient appeared in good health. Examination of shoulder showed two unhealthy-looking wounds on posterior aspect. The upper and larger one, just behind and below the acromion, was a superficial granulating area about an inch across. The lower wound, over posterior fold of axilla, penetrated deeper; X rays disclosed a piece of metal embedded in muscles at bottom of wound. Both wounds were decidedly septic and were treated by hot fomentations and rest to the arm. After 10 days the wounds showed little disposition to heal.

On July 23rd patient complained of some stiffness in the shoulder. Next day the whole arm from shoulder to wrist was in a state of tonic rigidity, and acutely flexed at elbow; no actual pain when arm was kept at rest; no painful spasms as yet; uneasiness in throat and right side of neck, and difficulty in swallowing food; pulse and temperature normal. In the afternoon Sir William Osler saw him and made the following note: "No fever; patient complains a little of pain in the epigastrium and back and right shoulder. The arm is flexed at the elbow; muscles stand out prominently and feel rigid. Patient can flex and extend the fingers, but cannot extend the arm; forcible extension does not hurt him. Pectoral muscles are not involved; deltoid feels stiff. Patient cannot lift his head off the pillow. He has occasional spasms of back and neck and arm with great pain. He opens his mouth fairly well."

By evening the paroxysms had increased in frequency and severity, as also in area involved. The muscles of whole right side of body except those of the leg were in a state of tense rigidity; the abdominal wall was retracted and hard as a board; the left side of the body, except the left side of the abdominal wall, was unaffected. Jaw clenched; head turned to right side. Painful paroxysms, affecting only the right side, were brought on by any attempt at movement.

By lumbar puncture 6 drachms of cerebro-spinal fluid[1] were drawn off and 2000 U.S.A. units of tetanus antitoxin injected into spinal canal; 2000 units also given intramuscularly; chloretone gr. xxx. per rectum.

July 25th: Patient slept at intervals during the night, but when awake suffered much from sickness and pain in head and legs; very profuse perspiration. Although the arm and right side of body generally remained rigid, the tetanic spasms did not increase in severity during the night. Another injection of chloretone, gr. xxx., per rectum and antitoxin, 2000 units, intramuscularly.

[1] Cerebro-spinal fluid examined was found to contain a faint trace of albumin, no sugar, no cells, no deposit.

On July 27th rigidity of right side and flexure of arm remained the same, the muscles of back of neck and posterior fold of axilla being specially hard; abdominal wall tensely contracted and very tender to touch. The jaw could be opened but very slightly; "risus" well marked. The arm could be forcibly extended to a considerable extent without pain, but on relaxing it it returned to its flexed position, and this was immediately followed by a painful spasm involving the whole right side. Even the leg was then thrust out as in cramp, but the foot appeared unaffected. Patient complained of sore-throat and severe pain in epigastrium. Retention of urine had been experienced, but catheter not required. Antitoxin 2000 units intramuscularly. Chloretone gr. xxx. per rectum.

On July 29th rigidity the same; several spasms noted during the night, confined chiefly to right upper quadrant of body. Jaw immovably fixed; feeding difficult. Only liquids could be taken, and the act of swallowing was very painful. Masses of tough dark phlegm formed in the throat were got rid of with extreme difficulty. Nutrient enemata commenced. Patient still lay with head turned to right side; mouth also drawn a little to the right, and eyes sometimes involuntarily rolled to that side; tongue bitten during sleep.

On July 31st the general condition was much the same. A notable feature was that the hand and fingers had been quite freely movable all along. Neither were they affected during the paroxysms of spasm.

On August 1st, except that abdominal muscles were still very hard and tender, the rigidity of the right side appeared to be relaxing. The head could be moved a little from side to side, but could not be raised. Teeth firmly clenched but separated a little during sleep. Painful spasms were still excited on small provocation.

On August 5th the general rigidity of the arm and forearm, and the tendency to attacks of spasm, were gradually becoming less pronounced. The jaws could be opened about half an inch, but the idea of solid food was dreaded. The patient was seen by Sir David Ferrier, who observed: "There is slight transitory ankle clonus in the right foot; no Babinski reaction; knee-jerk slightly exaggerated. The movements of the proximal muscles of the right limbs are involved in spasm, whilst the distal muscles (hand and foot muscles) are not affected. The abdominal muscles are very rigid. There is a certain amount of spasm of the thoracic muscles, but the expansion of the chest is found on measurement to be about normal. The platysma, trapezius, and sternomastoid on right side are only slightly rigid. The deltoid and biceps are very hard. The arm is firmly flexed at the elbow. It lies across the chest and cannot be voluntarily moved. Forced extension immediately produces spasm."

On August 6th there was severe abdominal pain, mostly on left side. On the 7th this pain extended down left leg, which was much swollen from the knee downwards. The internal saphenous vein was hard and very tender. An attack of acute phlebitis, depending on a thrombus, probably of the iliac vein, had thus supervened. For several days the swelling of the leg increased, and extended upwards to the groin, being accompanied by much pain, but only slight rise of temperature. In a week the swelling began to subside, and in another week the phlebitis had practically gone; slight swelling and discoloration of the leg persisted, however, for several weeks.

On August 13th, except for the muscles of right arm and forearm, which were still rigid, preventing full extension, the muscles of the right side were no longer in spasm. They felt abnormally soft and flabby. Patient was beginning to take solid food, but had a sensation as if his tongue were tied. Painful spasms were still excited in the arm on attempts forcibly to extend it.

From this time steady progress was made, but in spite of abundant nourishment and exercise the patient's whole muscular system was for months deficient in tone. He was easily fatigued, and complained of pains in the calves of the legs, and aching in the muscles generally, after even slight exertion. For a long time the arm movement was very imperfect, and the elbow could not be voluntarily, or even by force, brought into a straight position, or raised above the head. There remained a good deal of tenderness on pressure over the shoulder-joint and along the line of the cervical plexus.

With regard to the prophylactic effect of tetanus antitoxin it is rational to conclude that it will vary according to the amount of toxic material introduced into a wound, as well as to the dose of antitoxin given. It is also a well-established fact that the effect will be largely influenced by the route of administration, the intrathecal route having been found by far the most efficacious. Thus the result of an injection of the serum may be: (*a*) Complete neutralisation of the poison and non-appearance of the disease; (*b*) extension of the period of incubation and late appearance of the disease (delayed tetanus); (*c*) limitation of the

area affected by the disease (localised tetanus); (*d*) diminished severity in the manifestations of the disease (modified tetanus).

Clinical and also experimental evidence support the contention that each and all of these results have been attained. During the later periods of the war, when prophylactic treatment has been almost universally resorted to amongst the wounded in the Western front, the fall in the incidence of tetanus has been very remarkable. There is also evidence to show that wounds, in the discharges of which bacilli resembling *B. tetani* were found, and which were subsequently treated by antitetanic serum, have not been followed by tetanus.

The proportion of cases of tetanus with long incubation stage has largely increased since this mode of prophylactic treatment has become general. The comparative increase in the number of cases of limited or localised tetanus is abundantly shown by more recent reports. That the severity of the disease has been greatly mitigated by the prophylactic use of antitoxin is clearly shown by the marked decline in the mortality of the disease during recent years, both in this country and in America.

From considerations such as these the conclusion seems warrantable that the preventive treatment of tetanus by means of its antitoxin is a sound and beneficent measure which ought to be followed up to the fullest limits which experience dictates to be safe.

The curative treatment of tetanus by this same agent stands on a somewhat different footing, but the increasing number of recoveries recorded in cases where it has been energetically employed encourages the hope that here also we possess a remedy of unquestionable value. I can recall a case which I treated some four years ago by the combined intrathecal and intramuscular injection of antitoxin. This was a severe and rapidly developing form of the disease, exhibiting general tetanic convulsions with opisthotonos. No prophylactic had been employed in this case, yet, contrary to my expectation, recovery took place. In the case of Lance-Corporal ——, above recorded, the disease had secured a firm hold, and was rapidly increasing in severity up to the time of the first intrathecal injection. From that time the virulence of the attack appeared to be arrested, and no extension of the area involved was afterwards noted. The frequency of the paroxysms also seemed to be diminished in consequence of the treatment.

Referring further to the lance-corporal's case, there are one or two points of pathological interest. The unhealthy appearance of the wounds on patient's admission ten days after their infliction, and their resistance to careful treatment for a fortnight longer, suggested the presence in the tissues of something more than the mere fragment of metal. I have in several cases noted this unaccountable delay in healing in wounds subsequently followed by tetanus. It may be that tetanus spores lodged in a wound have the effect of maintaining an unhealthy septic condition; and this delay in healing, in the absence of any other obvious cause, may put the surgeon on his guard as to the possibility of impending tetanus in any case which obstinately resists ordinary methods of treatment. It may even lead to a diligent search being made in the discharges for the spores or bacilli of tetanus. A very notable circumstance in this case was the rapid improvement in the wounds which set in immediately after the first injection of antitoxin. The discharge ceased within two days and the wounds rapidly cicatrised.

The localisation and limitation of the disease in the above case also deserve attention. From beginning to end the attack may be described as strictly *unilateral*. At no period was any portion of the left side involved in spasm, with the exception of the abdominal wall and other parts where the muscles of the two sides act in association. Even in these the contractions were more marked on the right side. The anatomical continuity of the muscles of the two sides of the abdomen would account for the apparent spasm of the whole abdominal wall. It was also observed that throughout the attack the right hand and foot were entirely unaffected by spasm, voluntary movement and sensibility also being normal in both.

These observations are corroborative of the theories (*a*) that the morbid condition in tetanus is primarily confined to the nerves, spinal cord, and subcortical centres in direct connexion with the seat of infection, but that it may subsequently, in consequence of the intensity of the infection or in the absence of any counteracting influence, such as antitoxin, extend to the nerve centres generally, and thence involve the entire muscular system; and (*b*) that the channel of transmission of the tetanus toxin is principally the nerves leading from the point of infection, and not the blood current or the general lymphatic system.

With reference to the rigid condition of the arm and shoulder after the tetanic symptoms had passed off, the question arises, Was the stiffening, which persisted for many weeks, a result of (*a*) a fibrosis of the muscles mainly involved in the prolonged spasm, or (*b*) a periarthritis due to continued irritation of the metal which still was in close relation to the shoulder-joint, or (*c*) a nerve implication due to proximity of the metal to the sheaths of the brachial plexus? Probably all of these conditions participated in preventing for a long period the restoration of the arm to its full measure of utility.

In contemplating the removal of the piece of metal still *in situ* it will have to be borne in mind that such an operation is fraught with considerable risk of re-exciting the disease, and that special precautions, including a preliminary injection of tetanus antitoxin, will have to be observed.

Yet another remarkable feature of the case was the occurrence of thrombosis with phlebitis of the iliac and femoral veins as a sequel to the tetanus attack. I can find no record that this association has ever hitherto been observed.

A CONTRIBUTION TO THE STUDY OF DYSENTERY.

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(*An Interim Report to the Medical Research Committee from the Laboratory, Mont Dore Military Hospital, Bournemouth.*)

EARLY in October, 1916, it was ascertained by one of us (D. G. L.) that carriers of *Entamœba histolytica* cysts were to be found among the dysentery convalescents invalided from France and Flanders. It was therefore decided to search each convoy arriving from France for amœbic carriers as thoroughly as time allowed. Between Nov. 3rd, 1916, and Jan. 4th, 1917, 159 dysentery convalescents were admitted to the hospital direct from France. The incidence of carriers of *Entamœba histolytica* cysts among these 159 cases is indicated in Table I.

TABLE I.

Number of cases admitted.			Number of amœbic carriers discovered.		
British.	Australian.	Other Colonial troops.	British.	Australian.	Other Colonial troops.
134	21	4	13	5	0

So that nearly 10 per cent. of the British cases and 24 per cent. of the Australian cases were carrying *Entamœba histolytica* cysts.

Now examination of the blood of these amœbic carriers revealed the fact that in 7 out of the 18 cases the blood-serum agglutinated the *B. dysenteriæ* Flexner or the *B. dysenteriæ* Shiga in a dilution sufficiently high to warrant the diagnosis of a recent infection by one or other of these bacilli.[1]

This coincident finding of *Entamœba histolytica* cysts in the stools and specific agglutinating substances in the blood seemed sufficiently suggestive to warrant further observations

[1] The agglutination test was carried out by Dreyer's method with Standard Cultures prepared in the Department of Pathology, University of Oxford, on behalf of the Medical Research Committee. In this report the test will merely be referred to as being positive or negative for the test, and its diagnostic value will be fully dealt with in a separate report.

on the point. To date we have had access to 97 carriers of *Entamœba histolytica* cysts invalided from France or Flanders as dysentery convalescents. The results obtained by examination of the blood are shown in Table II:—

TABLE II.—*Agglutination Tests in the Case of Amœbic Carriers from France.*

Number of cases ... 97	
Number of cases in which the blood agglutinated B. Flexner	26
Number of cases in which the blood agglutinated B. Shiga	7
Number of cases in which the blood failed to agglutinate eitner B. Flexner or B. Shiga...	64

Of these 97 cases, 66 had never been with any other than the B.E.F., nor had they at any time previous to the war visited a country in which amœbic dysentery is known to be endemic. They must, then, have become carriers in France. In 38 of these 66 cases a history of contact with likely sources of infection was obtainable.

For sake of comparison it was decided to examine in a similar manner carriers of *Entamœba histolytica* cysts invalided from the Mediterranean area, with a few exceptions from Salonika. The results obtained are set forth in Table III.:—

TABLE III.—*Agglutination Tests in the Case of Amœbic Carriers from the Mediterranean.*

Number of cases ... 98	
Number of cases in which the blood agglutinated B. Flexner	5
Number of cases in which the blood agglutinated B. Shiga	28
Number of cases in which the blood failed to agglutinate either B. Flexner or B. Shiga	65

It will be noticed that the percentage of positive and negative agglutination tests is identical with that obtained n the cases invalided from France. When, however, the cases with positive agglutination tests are considered it is found that some 78 per cent. of the French cases are accounted for by the B. Flexner, whilst conversely over 80 per cent. of Mediterranean cases are accounted for by B. Shiga. Finally, amœbic carriers admitted to the hospital from the Forces in India, Mesopotamia, and Egypt have been similarly examined. The results are exposed in Table IV.:—

TABLE IV.—*Agglutination Tests in the Case of Amœbic Carriers from India, Mesopotamia, or Egypt.*

Number of cases ... 35	
Number of cases in which the blood agglutinated B. Flexner	1
Number of cases in which the blood agglutinated B. Shiga	3
Number of cases in which the blood failed to agglutinate either B. Flexner or B. Shiga...	31 (88·5%)

The experiments referred to above are, in our opinion, suggestive from several points of view. For the reason, however, that they only form the beginning of a series of researches we do not propose, for the present, to go more deeply into matters than we have already done.

One conclusion of practical import may, however, be emphasised. It is highly important that careful protozoological as well as bacteriological and serological examinations be made in every case of dysentery coming under investigation. A positive bacteriological or serological finding, for example, does not preclude the necessity for a careful protozoological examination.

In conclusion, it is a pleasant duty to acknowledge our indebtedness to Lieutenant-Colonel T. H. F. Clarkson, R.A.M.C., officer commanding Mont Dore Military Hospital, Bournemouth, for permission to publish this note and for whole-hearted support and encouragement.

LITERARY INTELLIGENCE.—The fourth edition of Mr. Comyns Berkeley's "Handbook of Midwifery" is announced for early publication by the house of Cassell. It has been considerably expanded to meet the additional requirements of the Central Midwives Board and to render it suitable for obstetric dressers.

TRAUMATIC DISLOCATION OF THE KNEE-JOINT:

A REPORT OF TWO CASES.

BY HARRY PLATT, M.S. LOND., F.R.C.S. ENG.,

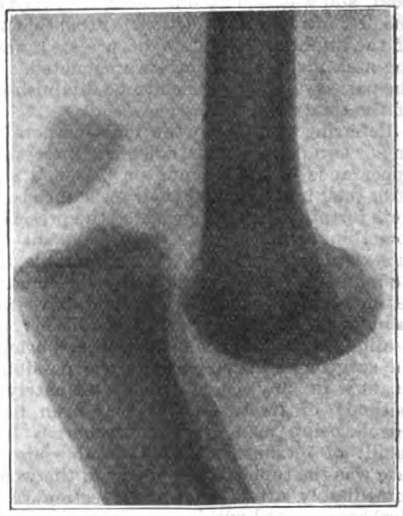
HONORARY SURGEON AND SURGEON IN CHARGE, ORTHOPÆDIC DEPARTMENT, ANCOATS HOSPITAL, MANCHESTER; CAPTAIN, R.A.M.C. (T.), 2ND WESTERN GENERAL HOSPITAL.

(*From the Orthopædic Department, Ancoats Hospital.*)

COMPLETE traumatic dislocation of the knee-joint is a condition seen so infrequently that it is well worth while recording all cases of this type. During the last 18 months two individuals with this rare injury have been admitted to the Ancoats Hospital, Manchester, under my care and I have had an opportunity of controlling the treatment in both cases and of observing the functional result obtained.

CASE 1.—L. S., a female aged 20, whilst crossing a field in the dark, slipped, caught her left foot in a hole, and fell over backwards on to her left side. She was brought to hospital on Sept. 17th, 1915, within an hour of the accident, a tentative diagnosis of fractured femur having been made by an outside doctor. On examination the left knee-joint revealed an obvious complete dislocation, the femur being displaced backwards, the upper end of the tibia being abnormally prominent, with a deep hollow above. The amount of effusion in and around the joint was strikingly small, and there were no signs of any circulatory obstruction in the limb. A radiogram (Fig. 1) was taken before reduction was attempted, this latter manœuvre being accomplished with ease by Dr. W. S. Booth, the senior house surgeon to the hospital. The limb was then put up on a back-splint, and after ten days' stay in hospital the patient was sent home to Wolverhampton, a plaster cast having been applied extending from the toes to the groin. Five months later the patient was readmitted to hospital and the cast removed. The injured joint was now absolutely stiff in the position of full extension; no motion could be elicited even though considerable force was exerted. A radiogram showed atrophy of the cancellous tissue of the bone ends, but there was a clear cartilage line on both bones. The girl began to walk on the limb, wearing a calliper splint for the first two months. Her present condition (15 months after the accident) is as follows: The knee-joint is firmly ankylosed, the patella being adherent to the anterior surface of the femur. The patient walks well without pain and is following her occupation.

FIG. 1.

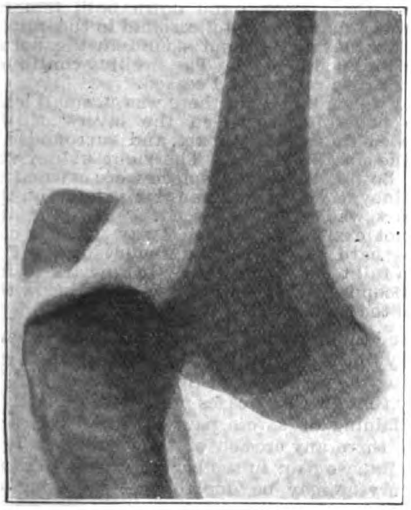


L. S., dislocation of knee-joint. Backward displacement of femur; no lateral displacement.

CASE 2.—J. E., a man aged 47, fell from the top of a ladder to the ground a distance of 12 feet, his left knee striking a plank, the point of impact being localised to the inner side of the joint. He was admitted to hospital on April 1st, 1916, some 20 minutes after the accident. The left knee showed all the signs of a complete dislocation, with the femur displaced backwards and slightly outwards. There was a moderate effusion into the joint, but no evidence of vascular obstruction. A skiagram (Fig. 2) was taken before reduction by the senior house surgeon, Dr. H. M. von Mengershausen. Reduction, as in the first case, presented no difficulties. At the end of a week the man left hospital with his leg in a plaster cast. This fixation was maintained for four months. On removal of the plaster the joint allowed five degrees of

active and passive flexion, and the patella was freely movable. On testing for abnormal mobility a slight "give" was experienced in both lateral directions. A calliper splint was provided and worn for six weeks. Seven months from the time of the injury the man began light work. His present condition (11 months after the accident) is as follows: The knee-joint is painless, and shows a range of 20 degrees of flexion; there is definite abnormal lateral mobility of the tibia on the femur; this can be elicited by firm manipulation, but is not evident to the man during ordinary use of the limb. The man is now working at his old employment as a labourer and is carrying out full duties with the exception of climbing ladders.

FIG. 2.



J. E., dislocation of knee-joint. Backward and outward displacement of femur.

In the two cases described above, as in all complete dislocations of the knee-joint, total rupture of both crucial ligaments with extensive tearing of the capsule, must have occurred. Under conservative treatment, prolonged over a sufficient period, there is every chance of spontaneous repair of these torn structures. This fact has been repeatedly emphasised by Robert Jones, who has seen some extraordinarily good functional results in this type of injury, when continued fixation has been employed. In several of the cases described by this author considerable degrees of motion have been preserved, enabling the individuals to return to full work involving kneeling or to indulge in active sports. The results in my two cases have fallen short of this ideal.

In the case of the young woman I am inclined to regard the period of fixation as too long; as she had gone home to the Midlands there was great delay and trouble in having her readmitted to the hospital; thus we lost valuable time. It is possible that in the course of time there may be a certain degree of stretching of the fibrous mass which fills up the position formerly occupied by the crucial ligaments, with a consequent development of motion in the joint. I have not considered it justifiable to attempt to gain mobility by the use of forcible passive movement, so in this case I look upon the result—viz., firm fibrous ankylosis—as likely to be permanent.

In the second case, after four months' work, there has been a definite increase in the mobility of the injured knee, but I do not anticipate further appreciable increase, as there is very stout resistance to flexion beyond 20 degrees. The man is doing heavy work with comfort, and expresses himself as very satisfied with the result. The accompanying radiograms are probably unique. For their existence and for the notes of the cases on admission to the hospital I am indebted to my former house surgeons, Dr. Booth and Dr. von Mengershausen.

References.—Jones, R.: Injuries to Joints, 1915; Notes on Military Orthopædics, part vi.; Brit. Med. Jour., August 5th, 1916. Jones and Alwyn Smith: On Rupture of the Crucial Ligaments of the Knee, and on Fractures of the Spine of the Tibia, Brit. Jour. Surgery, July, 1913.

OUR contemporary *Knowledge* (83, Avenue Chambers, W.C.1), which was founded by the late Richard A. Proctor in 1881 and has for many years disseminated accurate scientific knowledge in a popular form, is to be a quarterly magazine during the war.

THE OPERATIVE TREATMENT OF ABDOMINAL ANEURYSM.

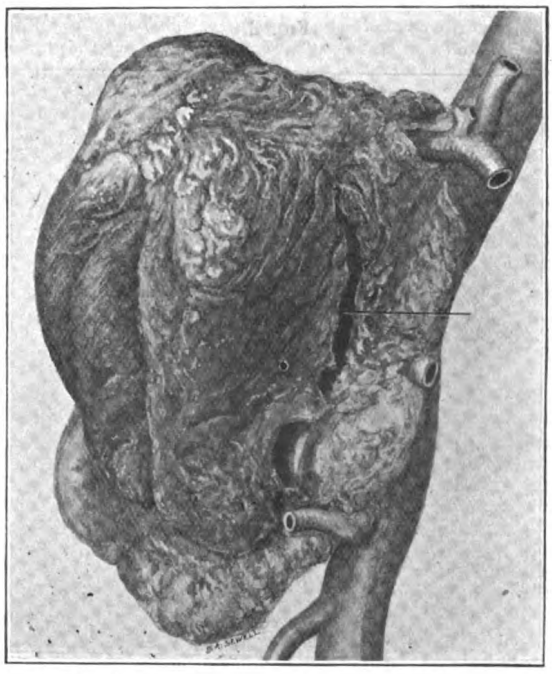
BY W. I. DE C. WHEELER, F.R.C.S. IREL.,
HON. MAJOR, R.A.M.C.; HON. SURGEON TO THE FORCES IN IRELAND.

FIVE years ago, at the annual meeting of the British Medical Association held in Birmingham,[1] I brought before the Association the details of two cases of abdominal aneurysm treated by operation. A year later a third case came under my care, and, like the others, was treated by the introduction of wire into the sac. I am now in a position to record the results of operation in the three cases, and in so doing hope to add some information to a subject which has engaged surgical attention for many years.

It is noteworthy that every reported series of cases treated by operation contains a percentage of cures, but the earlier cases dating from the year 1865 showed a discouraging mortality. Osler states that Nature occasionally cures a case. Now and again the physician is able to effect a cure, but he had never seen such a case, and in a few instances he thinks that the surgeon prolongs life or even effects a complete cure. Most of the cases mentioned by Osler lived from a few hours to six months after operation, one surviving three and a half years.

The recognition of the fact that the introduction of a foreign body into an unhealthy area, such as wire into an aneurysm, requires an aseptic technique of a very special kind, has rendered the results of recent operations more

FIG. 1.



Side view of aneurysm. The line marks the point of rupture. (One-half natural size.)

favourable. In a case of fracture treated by the application of screws and plates accidental sepsis may be retrieved by the removal of the screws and plate, but once the wire is introduced into the sac of an abdominal aneurysm it is past recall and the surgeon is unable to retrace his steps.

The use of Colt's apparatus[2] removes the danger caused by the advance of wire from the sac of the aneurysm into the aorta beyond. At least six cases succumbed to this cause in the old days. Rupture of the aorta or of a secondary aneurysmal sac may to some extent be obviated by the rigid application of antispecific treatment, as it is now understood. There is also the possibility of emboli being carried

[1] Brit. Med. Jour., 1911; THE LANCET, 1911, ii., 507.
[2] THE LANCET, 1903, ii., 808.

from the sac during, or after, the introduction of the wire; death from this cause, however, has been extremely rare.

The results of my three cases are as follows:—

In the first case of aneurysm of the aorta in the region of the cœliac axis, operated upon in August, 1910, a cage of 150 inches of Colt's wire was introduced. At the time of operation the aneurysm was thin-walled and seemed ready to burst. The patient is still alive and well, at daily work in a brewery. The aneurysm has consolidated and a loud systolic murmur present before operation has disappeared.

The second case, also reported upon in 1910, died in March, 1916, from rupture of the aneurysm, when acting as a stoker in the R.N.R. on board a patrol trawler. A wisp of 105 inches of wire was introduced in this case. A complete post-mortem examination was obtained, the details of which are given below.

The third case was operated upon in 1912 and died about a week after the introduction of the wire from rupture of the aneurysm following intestinal obstruction. A gastro-enterostomy was performed in this case as the aneurysm was obstructing the pylorus. The loop of jejunum fixed to the stomach became strangulated by pressure between the abdominal wall and the aneurysm; the consequent vomiting led to rupture of the sac.

In analysing these three cases the first man may be fairly said to be cured. The operation was performed six years ago, at a time when the sac was large and thin-walled. At present the only remaining sign of an aneurysm is a hard mass which transmits the pulsation of the aorta to the abdominal wall. The patient is in good health and performs a full day's work.

The second case lived over five years, and died, while acting as a stoker on board a trawler, from rupture of the sac. From the post-mortem examination it may be fairly claimed that this case was practically cured, and but for the fact that the man was occupied in one of the most strenuous occupations the greatly consolidated aneurysm might never have ruptured.

FIG. 2.



X ray photograph showing Colt's wire within the sac.

No conclusions can be drawn from the result of Case 3, the rupture of the aneurysm after the introduction of the wire being obviously due to the vomiting of acute intestinal obstruction.

I am indebted to Surgeon H. E. King Fretz, R.N., for the following post-mortem examination and other notes on Case 2.

The patient, aged 37, a stoker, R.N.R., on one of the patrol trawlers, was admitted into the Naval Hospital on March 12th, 1916. He complained of vomiting and severe shooting pain in the right lumbar region simulating renal colic. There was tenderness in the region of the appendix and pain on deep inspiration. He was sweating freely and in a state of collapse. There was a large pulsating tumour which practically occupied the whole of his epigastric region, apparently an aneurysm of the abdominal aorta. His temperature was 97° F.; pulse 120, full and regular; systolic pressure 280 mm., diastolic pressure 120 mm. His urine showed a heavy deposit of urates and a trace of albumin. There was an excellent scar to the left of the mid-line 3 inches long, the result of operation five years ago. A systolic bruit could be heard over the swelling, propagated all over the abdomen and down both femoral arteries. There was a marked diastolic sound in the mitral area and a very accentuated second sound in the aorta. Seven days after admission he died. The swelling continued to pulsate long after respirations had ceased.

At the autopsy it was found that there was a small leak, the hæmorrhage penetrated between the layers of the mesentery, separated them widely apart, and surrounded a large portion of the small intestine. The right kidney was pushed forward. Both kidneys and spleen were normal in size, the right kidney having small granular patches on the surface. The heart was much enlarged. "Now for the aneurysm, I am not exaggerating when I say that the clot formed in it is as hard as a rock, the aneurysm itself is about the size of a full term fœtus' head. It appears to me as if there is a secondary dilatation of the aorta below the main swelling and that is where the trouble arose."

I am also indebted to Surgeon King Fretz for the specimen which is faithfully illustrated in Fig. 1, and for the X ray photograph showing the wire *in situ* (Fig. 2).

It is noteworthy that all three cases presented themselves at hospital complaining of severe pain in the back, and that in none was there any erosion of the vertebræ. It is possible that the intense pain in the back, common to cases of abdominal aneurysm may be due to the stretching of the highly sensitive posterior parietal peritoneum, which is also in these cases subject to a pull at every pulsation of the tumour.

Dublin.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

Exhibition of Autochromes.

A MEETING of this section was held on March 27th, Dr. T. D. ACLAND being in the chair.

Dr. C. R. BOX and Mr. WALTER EDMUNDS exhibited a series of autochromes illustrating the rashes of rubella, measles, scarlet fever, typhoid, cerebro-spinal fever, and pellagra in cases treated at the London Fever Hospital. The autochromes were the products of a three-colour process, the rays of light being transmitted through starch granules, coloured respectively green, orange, and violet, before coming into contact with the customary photographic emulsion. This permitted a very faithful portrayal of the characteristic rashes. The chief drawbacks to the method were the length of exposure necessary with daylight, the intensity of the arc light required when daylight was not used, the impossibility of reproduction, and, for demonstration purposes, the short distance from the screen at which the images must be viewed to appreciate their details.

SECTION OF SURGERY.

Treatment of Severe Infected Gunshot Injuries of the Shoulder and Elbow Joints.

A MEETING of this section was held on March 14th, Colonel H. J. WARING being in the chair.

Major R. H. JOCELYN SWAN read a paper on the above subject, in which he advocated early excision of the joints with the object of obtaining mobility. The paper is published in full in our present issue.

Mr. KENNETH GOADBY, who had been collaborating with Major Swan, spoke from the bacteriological standpoint. He showed by lantern slides of the pus the high degree of septicity of such wounds. Besides ordinary pyogenic organisms, anaerobes (*B. perfringens*, the bacillus of malignant œdema, *B. Hibner IX.*) were commonly present. The streptococci did not seem to be as virulent as those found in civilian practice, such as in post-

mortem wounds, for the percentage of cases in which septicæmia resulted was very small. The anaerobic organisms were found in great numbers in the damaged bone tissue, especially in sequestra and in fragments of detached bone; this lent support to the method of treatment adopted by Major Swan, especially in view of the fact that the organisms persisted for many months in their comparatively secluded positions. He attached some importance to the preparatory course of mixed vaccines which had been employed. Since early treatment was desirable he advocated the use of heterogeneous vaccines prepared from cultures grown on the blood of patients who had got well and sensitised with the corresponding antitoxins until an autogenous vaccine had been prepared.

Colonel WARING agreed in the main with the contentions of Major Swan. His experience had led him to prefer early excision and free drainage, with efficient flushing, to primary incision and excision at a later date. Speaking of the muscular power which might follow excision of joints, he recalled a case of a man whose elbow-joint had been excised in pre-aseptic days, but who had subsequently been able to carry on his work as a blacksmith.

Mr. RAYMOND JOHNSON spoke of the unsatisfactory results from treatment by incision, drainage, and flushing alone in the early stages, and thought that Major Swan had made out a case for his method which demanded for it a satisfactory trial. It was desirable, he thought Major Swan would admit, to excise the ends of all the bones entering into the joint, whether all were damaged or not. In two cases under his observation where this had not been done the results had not been good.

Dr. HELEN CHAMBERS said that observations which she had made at the Women's Military Hospital, Endell-street, had shown that irrigation by solutions into septic wounds only rendered the surface sterile when one of two solutions was used—eusol or Dakin's solution. Even then the result was only temporary. What was needed was some application the effect of which was continuous. Such could only be applied in the form of a paste. The bismuth-iodoform paste satisfied the condition and had proved very useful.

Major SWAN, in his reply, agreed that excision of all the ends of bones was desirable provided that the gap produced was not unduly wide (wider than two fingers' breadth). He had not found any one solution of greatest value, but favoured a change from one solution to another. He was not convinced of the usefulness of bismuth-iodoform paste, having met with failures where he had to remove it, and had found the surrounding tissues contained many organisms.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

Pneumonia in the Puerperium.—Backward Displacement of the Uterus.

A MEETING of this section was held on March 2nd, Dr. GIBBON FITZGIBBON, the President, being in the chair.

Mr. SPENCER SHEILL read a paper on a case of Pneumonia in the Puerperium. The patient developed a mammary abscess, which was opened on the eleventh day. Up to the ninth day her temperature was normal. After the operation double septic pneumonia set in, from which she died six days later. There was no evidence of septic infection elsewhere than the breast. The principal point of interest was the origin of the pneumonia.

Dr. R. D. PUREFOY said it appeared to him that the breast condition was a local evidence of a general septic condition, which developed with accelerated speed after the abscess was treated. Rokitansky and McClintock had recorded cases of puerperal sepsis, attended with suppuration in the breast.

Dr. BETHEL SOLOMONS considered that the case was probably one of embolic pneumonia, secondary to the mastitis. He regretted that Mr. Sheill had not attempted to obtain a culture from the mammary pus or from the uterus, as an autogenous vaccine might have helped in treatment.

Dr. H. C. DRURY showed charts of patients who had developed pneumonia during pregnancy. The prognosis was, he said, favourable for the mother and bad for the child, as premature labour often occurred. Labour had a beneficial effect on the disease.

Mr. SHEILL, in reply, stated his belief that septic emboli from the breast caused the trouble, and that these were admitted to the circulation by the use of Bier's apparatus, which created such powerful suction as to rupture some small veins, and that when the pressure was released septic matter was drawn into these veins. He suggested that suction treatment was fraught with danger in cases where the abscess did not freely communicate with the surface.

Dr. ALFRED SMITH read a paper on the Operative Treatment of fixed Backward Displacement of the Uterus.

Reviews and Notices of Books.

Glaucoma: A Handbook for the General Practitioner. By ROBERT HENRY ELLIOT, M.D.Lond., F.R.C.S.Eng., Lieutenant-Colonel I.M.S. (retired). London: H. K. Lewis and Co., Limited. 1917. Pp. 60. Price 3*s.* 6*d.* net.—Lieutenant-Colonel Elliot has written a short but clear account of glaucoma, excellently illustrated. He deals successively with the anatomy of the parts concerned in glaucoma, the intraocular pressure, the pathological anatomy, causes, diagnosis, signs and symptoms, and treatment of the disease. He has addressed the general practitioners, but whether these readers will find the help they require is in our opinion doubtful. The book is written from the specialist's point of view, and insufficient guidance is given as to diagnosis, which is, after all, what the general practitioner wants. For example, he should be instructed minutely as to the distinction between iritis and glaucoma, yet the only reference to iritis in the whole book occupies less than three lines. In spite of the usual warnings as to the use of mydriatics the author says, on p. 51, "there are cases in which the bold use of atropine or of eserine, selected according to the exigencies of the individual case, may prove invaluable." The exigencies which demand the use of atropine are by no means precisely stated, and the general practitioner will gain little help from such statements. Neither will he be much the wiser for brief accounts of all the modern operations for glaucoma, several of which have been practically abandoned in England. We agree with nearly all that Lieutenent-Colonel Elliot says in his book, which none the less appears to us to fail somewhat in the object for which it was written.

Collected Papers on Circulation and Respiration. Second Series. Clinical and Experimental. By Sir T. LAUDER BRUNTON, Bart. London: Macmillan and Co. 1916. Pp. 719. Price 5*s.* net.—Brunton did not live to see the completed publication of his collected papers on Circulation and Respiration. This second volume is a large one, containing 68 articles with 256 illustrations covering a period from 1883 to 1915. The last article on Functional Diseases of the Arteries was published in our columns in July, 1915. Some of the articles, such as that "On Posture and its Indications," are almost classical in their familiarity; all give evidence of Brunton's chiefest aim in life to leave therapeutics as a science, instead of merely an art as he found it. This volume is not merely a monument of hard thinking, but also a token of the success of his aim.

Minor Surgery and Bandaging (Heath and Pollard). For the Use of House Surgeons, Dressers, and Junior Practitioners. By H MORRISTON DAVIES. M.D., M.C.Cantab. Sixteenth edition. London: J. and A Churchill. 1917. Pp. 476. Price 8*s.* 6*d.*—Three years ago this 55-year old manual was successfully remodelled with a view to modern requirements. A chapter has now been added on the general principles of treatment of gunshot wounds of the limbs. The author states in his preface that it would be impossible to deal generally with the whole subject of military surgery without materially altering the scope and character of the book. We think that in the next edition this will have to be done, as the surgical lessons of the war are not long to be kept in a water-tight compartment, but will have their influence on every department of peaceful surgery.

The Microscopy of Vegetable Foods. By ANDREW L. WINTON, Ph.D., with the collaboration of Dr. JOSEF MOELLER and KATE BARBER WINTON, Ph.D. Second edition. With 635 illustrations. London: Chapman and Hall, Limited; New York: John Wiley and Sons, Inc. 1916. Pp. 701. Price 27*s.* 6*d.* net.—The increasing number

of publications on the microscopy of vegetable foods may be welcomed as likely to be helpful in the detection of fraud. The pioneer work in this direction was largely done in THE LANCET Analytical Commission, which in the "seventies" exposed, by means oftentimes of the microscope alone, the extent to which the adulteration of foods was then practised. This exposure subsequently led to legislative steps being taken which are now embodied in the present Sale of Food and Drugs Acts in this country. The authors of this large volume have taken considerable pains to produce a work of value, and its text and the illustrations will give assistance to analysts and others in this country as well as in the United States. The chapters on histology and morphology are the best features of the book, but now and again the illustrations are not as well drawn as they might be, and the context here and there is meagre and scrappy. A good deal of ground is, however, covered, and the copious references to literature serve a useful purpose.

X Rays. By G. W. C. KAYE, M.A., D.Sc. Second edition. London: Longmans, Green, and Co. 1917. Pp. 285. Price 9*s.*—We welcomed the appearance of this authoritative book when it first appeared three years ago. The present edition has been revised by the author, as far as his military duties permit, up to the middle of 1916. A chapter on X ray equipment and technique has been added by Mr. W. F. Higgins. Accurate in presentation and attractive in style the book will continue to achieve its purpose.

Sewerage: The Designing, Construction, and Maintenance of Sewerage Systems. By A. PRESCOTT FOLWELL. Seventh edition, revised and enlarged. London: Chapman and Hall, Limited; New York: John Wiley and Sons, Inc. 1916. Pp. 540. Price 12*s.* 6*d.* net.—This book illustrates with a wealth of detail the way in which the problems of sewage engineering and disposal are being attacked in the United States. It deals fully with the important question of practical sewer construction, and is divided into four parts, the first devoted to designing, the second to construction, the third to maintenance, and the fourth to disposal. The question of utilisation does not appear to have come any nearer a practical issue in the United States than it has done in this country. In fact, the writer says, speaking of chemical treatment and precipitation methods, "no method has yet been found by which the fertilising values of sludge can be made use of to sufficient advantage to induce farmers to use it even when it is given them free of cost, except in a few cases." The author then refers to the sludge ships which convey the sludge from the London sewage works 50 miles out to sea and dump it there. The book will be valued by engineers engaged in this important branch of sanitary science and to some extent by chemists, the appendix containing a useful account of the analytical methods employed in testing sewage, and a short bacteriological section on the examination of effluents in regard to bacterial reduction.

Essentials of Physiology. By F. A. BAINBRIDGE and J. ACWORTH MENZIES. Second edition. With 173 illustrations. London: Longmans, Green, and Co. 1916. Pp. 478. Price 12*s.* 6*d.* net.—This is the second edition of a companion volume to the "Essentials of Histology" (Schäfer), of "Morbid Histology" (Grünbaum), and of "Chemical Physiology" (Halliburton), and maintains the high standard of the series. Although avowedly written with the primary object of meeting the requirements of the medical student preparing for a pass examination, it is in no sense a cram-book, and no one can read it carefully without gaining a useful insight into the whole field of modern physiology. The book is indeed remarkable for its even and adequate treatment of all parts of the subject, and for the average high standard of the illustrations which are drawn from many sources. The text is clear and interesting to read.

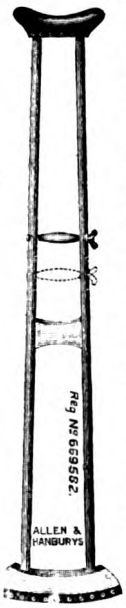
Some Modern Methods of Ventilation, with Special Reference to Public Buildings. By R GRIERSON. With illustrations, charts, and tables. London: Constable and Co., Limited. 1916. Pp. 187. Price 8*s.* 6*d.* net.—While the author's point of view is largely the engineering one, it is clear that he keeps in mind the physiological considerations on which methods of ventilation must be based if they are to give satisfactory results. Thus he speaks of the "conditioning" of the air which is the most important factor in the situation, and he accepts the dictum of Dr. Leonard Hill that the physical effect upon the skin is the supremely important thing, not its chemical effect. This view has now received general acceptance, and so the conditioning of the air as regards its physical state—e.g., humidity, movement, equable temperature, freedom from dust, and so forth—is much more to the point than keeping down a carbonic acid gas contamination. As the author observes, "Even more disconcerting to the old school of hygienists must be the growing practice of American engineers to arrange for recirculation of the air many times in succession," and the washing plant is left to maintain the air of the ventilated space in a pure condition. This system, it is added, effects considerable economy in the fuel bill in cold weather, and we may take it that the authorities are satisfied that the air so treated is wholesome. The book contains much useful information on standards of ventilation, design of ducts, selection of fans, washers and heaters, specifications, test-forms, and specimen schedules for designers, which will be consulted with advantage by those approaching these questions from a practical and rational point of view.

A Hausa Botanical Vocabulary. By JOHN M. DALZIEL, M.D., B.Sc. Edin., D.T.M. London: T. Fisher Unwin, Limited. 1917. Pp. 119. Price 6*s.* 6*d.* net.—The author of this useful compilation is a member of the West African Medical Staff, and has carefully utilised his opportunities. The book is more than a vocabulary, and many descriptions of plants are given under their native names. Under *dawa*, Guinea-corn or great millet, are described some two dozen varieties of a food which the Hausa eats in the form of porridge, and to which he attributes special strength-giving properties. The medicinal plants include a small field herb of the order *Polygalaceæ*, *sa hankaki dako*, which is used in syphilis on the ground of its local reputation. At the end of the book is given an index of genera and of popular names.

New Inventions.

AN IMPROVED CRUTCH.

ANY improvement in the construction of crutches will no doubt be welcomed at the present time. A crutch made of the ordinary ash sticks is shown in the diagram fixed at the lower end into a piece of hard wood curved at the base and shod with rubber (which I shall call the roller), and screwed to a block fixed below the handle. The handle is fixed by a bolt and fly-nut and can be adjusted to suit any length of arm. The head is of the bridge type, the webbing stretched across being tubular and stuffed with horse-hair. Attention may be drawn to the use of the roller at the foot, by which the rate of progression is materially increased and the pressure on the axilla is reduced. As compared with the ordinary type of crutch the pace is increased, at each step, by the length of the arc of the circle taken by the roller. This arc has been fixed at about 11 inches or less as being easily accommodated in railway trains, omnibuses, and other places where space is important. The most serviceable curve is the arc of a circle having a radius of 2 or 3 ft. An important feature is the reduction in the tendency to skid on slippery surfaces.



The new crutch has its defects: it cannot be shortened so easily for use by a smaller man, it is heavier than the ordinary form of crutch, and it is a little more costly to produce. The extra weight is probably the only defect which will not in time be remedied, and even this is largely compensated by the improvement in the balance which renders it more easily controlled.

Mr. George E Healing, 3, Wilton Crescent-mews, Belgravia, is the inventor, and the makers are Messrs. Allen and Hanburys, Wigmore-street, W.

Wimpole-street, W. C. A. JOLL, F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, APRIL 7, 1917.

Radiation in Malignant Disease.

As old diseases are abolished or brought under control, new ones arise or new aspects of disease which were previously overlooked. But cancer remains with us in spite of half a century of special hospitals and many years of intensive research, and the new Ministry of Public Health when instituted will find no task of greater difficulty or importance than to deal with malignant disease in all its forms. Recent work with radium and the X rays in cases of malignant growth has begun to raise some hopes of a possible solution in this direction. That we have in these sources of radiation a powerful ally in the war against malignant disease is now very generally admitted, but it cannot be said that it is being employed as yet to an extent justified by our present knowledge. The reports and the paper by Captain A. A. RUSSELL GREEN published elsewhere in this issue will serve to call attention to what is now actually being achieved, and a careful examination of the results attained by the workers in Edinburgh, Manchester, and Birmingham must, we think, go far to convince even the most sceptical of the value of the methods employed.

The site of the growth naturally has a material influence on the treatment. It is more or less an axiom among radiologists that the more superficial the lesion the more likely is it to be benefited by any form of radiation, and the high percentage of successful results in the treatment of rodent ulcer illustrates this clearly. Difficulties increase in direct proportion to the depth to which the disease has invaded, the deeper structures, and modifications in technique are required on this account. A study of the cases given in the reports from Edinburgh and Manchester especially shows that some measure of success has attended the efforts to overcome these difficulties. The burying within the growth of tubes containing either radium or its emanation has produced excellent results, and this method holds out possibilities of permanence, since the base of the growth, from which metastasis arises, is attacked concurrently with its more superficial parts. A further and a logical application of the principle here involved would indicate the removal of the more superficial parts of a malignant growth in order that the base may be more efficiently attacked. The remarkable control of the X rays and radium over fungation removes the surgeon's most serious objection to operating under these circumstances, and is a further argument for a still closer coöperation between the surgeon and the radiologist than exists at present.

The choice between radium and the X rays in dealing with cases of malignant disease is still in the stage of discussion, and it is doubtful if any good purpose could be served by advocating one at the expense of the other. Each has its advantages as well as its disadvantages, and they have much in common. The difficulty of obtaining radium in any quantity makes it rare, but its scarcity is compensated for largely by the constancy of its output—a condition that has greatly facilitated the development of radium therapy. In contrast with the irregularity of the output from the X ray tube radium itself gives us a profuse supply of radiation easily and cheaply obtained. This drawback to the use of X rays is, however, materially reduced in the latest form of tube construction. Indeed, as a result of the introduction of the Coolidge tube it is not impossible that X ray therapeutics will undergo very considerable modifications. Whichever method, however, is being practised, certain points have already emerged with more or less certainty, and the most important of these is the danger of delay. Every day's delay diminishes the patient's chances of complete recovery, and this principle applies particularly to operable cases. However favourable a case may appear, no surgeon can be sure that he has removed every trace of malignancy, or, indeed, that he himself has not scattered malignant cells over the field of operation. Nothing should be left to chance, and as prophylactic radiation involves no necessity for disturbing the dressings or the patient, it should be commenced the day after operation. Another important matter of general agreement is that within reasonable limits long applications are preferable to short ones. Perseverance, too, is a scarcely less powerful factor for success. Many patients needlessly throw away months or years of useful and comfortable existence through failure to follow the advice that is given them. In the light of the experience hitherto gained it is not too much to say that a good case has been made out for the use of some form of radiation in the great majority of malignant cases, and that its more general employment will have a favourable influence on their prognosis.

The Departmental Committee on Approved Societies and National Insurance.

THE Departmental Committee which has had the finance of Approved Societies under its consideration in connexion with the part played by them in National Insurance issued an Interim Report in May and a Further Report in October, 1916, bringing its labours to a conclusion with a Final Report in February of the present year. The Committee was asked by the terms of its reference, it will be remembered, to report upon any amendments in the financial scheme of the National Insurance Acts which experience of the administration of sickness, disablement, and maternity benefits might suggest to be desirable. The amendments to be considered would, it was thought, necessarily be within the limits of contributions and benefits as they now stand and apart from

further grants by the Exchequer, although last week's resolution proposed by Mr. KINGSLEY WOOD, a member of the National Insurance Advisory Committee, at a conference of Approved Societies, foreshadowed a substantial increase in maternity benefit as part of the expected infant welfare legislation. Further, the Committee was asked to make recommendations as to how far amendment of the National Insurance Acts and of the regulations made under them might simplify the work of the Societies and reduce its cost without detriment to the interest of the insured. The subject of the inquiry was therefore strictly limited to criticism, and to proposals having for their object the effecting of improvement under existing conditions or under conditions not radically altered, in matters connected with the finance and administration of Approved Societies.

In the two reports issued last year the Committee dealt with a variety of subjects intimately affecting Approved Societies and their finances, and suggested means whereby it seemed that a substantial measure of simplification in the machinery of the Acts and regulations might be secured. It was of the opinion, as stated in the report issued in October, 1916, that in the circumstances in which the Approved Societies were called upon to take part in National Insurance it would be neither fair nor reasonable to expect in the earliest youth of a newly devised system a simplicity and smoothness of working equal to that already established by the Friendly Societies after long experience in the conduct of their usual affairs, and it was predicted that whatever changes might be brought about as the result of experience, compulsory insurance upon the lines with which we are now becoming familiar must necessarily remain a highly complicated and intricate part of our social machinery. The report neither supported the views of those who complain that the Acts are too cumbrous and complex in character, nor did it express any expectation that its own deliberations would have as a result the cessation of complaints along the familiar and often reasonable lines. Those interested in the aspects of State insurance which present themselves to, and concern the Societies will, of course, study the reports as published. If they are technical they are carefully confined to elucidating the essential features of the matters dealt with, which are not always those which concern the medical profession as a whole, closely associated as that profession is with the working of National Insurance. The question of paying sickness and disablement benefit in respect of illness due to venereal diseases is, however, one matter in which the medical profession is deeply interested, as the stewards of the public health of the country rather than in the rôle of pathologists. The Committee recommends in its Final Report that, having regard to the danger to the community in the case of the person affected by venereal disease, Societies ought so to alter their rules as to enable benefits to be paid to a class of sick and disabled persons who hitherto have been excluded from them. The suggestion has everything to commend it, as is reflected in the opinion of all intelligent laymen. The sick person of the class which depends upon a Friendly Society for maintenance when wages cease on account of inability to work has a better chance of recovery when he is able to draw a weekly sum for his sustenance than he has if cessation of work means complete loss of income. He is also more likely, if he can draw sickness benefit without hindrance or comment and as a matter of right, to take effective steps towards regaining health in the early stages of illness. His recovery will remove a source of danger to other members of the community, and the prevention, or, failing this, the prompt treatment of his disease, is a matter now rightly recognised as one of national importance. At the same time, the alteration of the rules of a body of contributors to a common fund, in order to allow payments to be made to a class which was expressly excluded from participation in that fund when those contributors agreed to subscribe to it, presents some difficulty. The objections of those who will oppose any such change as that indicated will not necessarily depend upon sentiment or prejudice due to the association of venereal diseases with avoidable acts of immorality. They will be founded upon the entry of subscribers into a contract under conditions which it is proposed to alter to their detriment, a possible compensation being offered to them dependent upon the acquisition of a disease from which they may see no prospect of suffering. How far the opportunity to benefit the community by helping to diminish the prevalence of venereal diseases may appeal to persons thus situated will be tested if the recommendation of the Departmental Committee is sought to be adopted in any particular society, but the objectors will certainly occupy a strong position. Another question of equal or greater importance, financially and otherwise, to the Societies and their members is that of the payment of sickness and disablement benefit in the case of tuberculous disease during the period of after-care. As to this, the Committee refers to the existence of a national scheme, liberally assisted out of public funds, for the treatment of the whole community, including the uninsured and the insured. In view of this, the Committee did not feel justified in asking that the Societies should undertake a fresh burden. They had it in their power to render material assistance and to develop their policy so as to facilitate the promotion of useful experiments in "the wider field of public health," and beyond this they should not be asked to go. A third question, connected with the public health side of National Insurance, relates to inquiries into the causes of excessive sickness. As to this, the Committee pointed to the examples before it of the segregation of insured persons into societies of distinctive occupational hazard, and advised that the Insurance Commissioners, before any inquiry of the kind referred to was held, should satisfy themselves that a *prima-facie* case for holding it had been made out.

With reference to the Further Report of the Committee made last October, we are reminded,

while dealing with the Final Report, that the former contained a useful recommendation affecting hospitals and the duties of Approved Societies towards them in respect of payments. The bulk of the Further Report, as we have said, was concerned with finance, and was of interest mainly to the Societies themselves, but the recommendation referred to dealt with contributors who are hospital in-patients, and to the inability of Approved Societies to pay benefit to any member for his own direct personal benefit while an inmate of an institution. The Further Report of the Committee advised that payment should be made to the dependents, if any, of a patient in a hospital or institution if he should so desire, and that in the case of a patient without dependents money otherwise due to him should, on his authorisation and at the discretion of his society,

(*a*) Be utilised, in whole or in part, to defray any expenses otherwise than in respect of treatment or maintenance, for which he may be, or become, liable while he is in the institution; or so far as not so utilised, (*b*) be paid over to the authorities of the institution (not being a Poor-law institution, or other institution maintained out of public funds) under an agreement entered into by his society, either generally or in the particular case.

This would appear to render the contribution of an Approved Society to a hospital in respect of a particular patient dependent upon a combination of circumstances which would limit such payment to comparatively few occasions. Contributions to Insurance Committees in respect of tuberculous patients treated in sanatoriums, also dealt with in the Further Report, are on a somewhat different basis. The Committee here took the view, laid before it by some of the witnesses, that money so paid would better be devoted to helping the patient to recover complete health after discharge from the sanatorium. The three reports taken together constitute an interesting document, the very limitations of which, due to restrictions of the reference made to it, serve to remind us of the impossibility of dealing effectively and upon a large scale with many of the problems of National Insurance before war is over. Sir E. CORNWALL doubtless had this difficulty in mind when he stated in the House of Commons last Monday his intention of making the Advisory Committee to the Insurance Commissioners a more workmanlike body by reducing its numbers from 168 to 30; and his proposal to appoint a small separate medical advisory committee is also a step in the right direction.

DONATIONS AND BEQUESTS.—By the will of the late Mr. Francis Reckitt, of Beaconsfield, Bucks, the testator bequeathed £5000 each to the Great Northern Central Hospital, for their Convalescent Home, and Dr. Barnardo's Homes; £2000 to the King Edward's Hospital Fund; £1000 each to the Royal Hospital for Incurables, Putney, the Mount Vernon Hospital for Consumption and Diseases of the Chest, Hampstead, the Hull Royal Infirmary, and the Hull and East Riding Convalescent Home; £500 each to the Hull Children's Hospital and the Cancer Hospital, Brompton.—The late Miss Caroline Emma Chretien has left by will the proceeds of the sale of Nelson House, Bexley Heath, to Bexley Cottage Hospital for an enlargement of the hospital to be known as "the Chretien Wing or Ward," and from the proceeds of sale of her other real estate legacies to the Royal Blind Pension Society and Poplar Hospital for Accidents. Under the same will the London Hospital will receive Consols and stock of the value of nearly £5000.

Annotations.

"Ne quid nimis."

MODERN CARDIOLOGY.

IT is probable that the treatment of heart disorders can show a more substantial advance during the last 20 years than has been witnessed in any branch of our science since Laennec revolutionised our knowledge of thoracic disease a hundred years ago. The contributing factors to this chapter in clinical medicine, which has been ably reviewed by Dr. G. A. Sutherland in the Lumleian lectures this year, are to be traced, not only to the improved instrumental methods of examination of the heart, but particularly to the newer conceptions and clinical ideas which these methods have engendered. For a long time it happened that our knowledge of the physiology of the circulation advanced in the laboratory, while the practical application of that knowledge remained very limited. Even the introduction of the earlier graphic methods failed to realise the hopes which were founded on them. A certain scepticism was aroused as to their value at the bedside, and this attitude extended at first to the later polygraphic methods of Sir James Mackenzie. But the conditions were entirely different when Sir James Mackenzie's work began to attract the thoughtful attention of clinicians. Gaskell had by this time established the coördinating factors of auricular and ventricular action. Mackenzie perfected the means of clinically studying their respective actions, and, advancing along these lines, recognised that irregularity of the heart's action may not only be a matter of academic interest but might offer the key to the whole clinical course and character of many cardiac conditions. There had been evolved, in fact, a living pathology of the heart. Discovery followed discovery in quick succession, culminating in the final recognition of that most important condition, auricular fibrillation. The story of that condition—how it came to be identified and how its practical significance, and, above all, its response to treatment were verified—forms one of the most satisfactory chapters in clinical medicine, and was effectively detailed in our columns by Dr. Sutherland. Criticism will naturally not be wanting when some of these newer conceptions run counter to the teachings of the past, and Dr. F. J. Smith finds that Dr. Sutherland's exposition of modern cardiology defaults in not doing proper justice to the teachings, and especially the therapeutic successes, of such leaders of medicine as Gawen Sutton and Andrew Clark. We think Dr. Smith, while rightly standing out against what he considers slight of the labours of past teachers, has not appreciated the real situation. There need be no quarrel with the older school, no lack of reverence and respect for those past masters to whom we owe so much. It is the manner in which their views have been distorted by subsequent teachers which, we imagine, falls mainly under Dr. Sutherland's condemnation. Newer methods have certainly widened our views of heart disease, but in doing so they have also induced an even greater sense of our ignorance than was perhaps felt by some of the earlier teachers to whom cardiac pathology must have seemed a simpler affair than it is to-day. More-

over, if the upshot of modern learning is to confirm previous routine a great advance has been made—the advance from empiric routine, with its risks of misapprehension, to scientific procedure with its sure basis for application and modification. We do not find, therefore, Dr. Sutherland's lectures lacking in respect for anything that is vital in the teachings of his predecessors, and while mere theory finds small space in his lectures, cardiac therapeutics, as far as they are represented in the employment of digitalis, receives the careful attention which it merits, and we think that many of the older clinicians, had they been present at the lectures, would have been gratified to find their intuitions confirmed by later physiological research. Heart-block is now found to be a far from rare clinical condition, and other arrhythmias have their true place and significance in pathology. All this work has come to stay. But if one thing stands out more particularly revealed by these new methods it is this: the essential importance of clinical subjective symptoms. This later work has only heightened the significance of the patient's own feelings, his "field of cardiac response." Instrumental methods can never replace clinical bedside observation, and it is to this latter field that these Lumleian lectures are so fittingly devoted. And while we respect and have every sympathy with Dr. Smith's attitude in championing the memory of the great men gone from us, we do not think that the neglect of which he complains has occurred widely or is in evidence in the last Lumleian lectures.

MIGRATION OF SHELL FRAGMENT FROM THE FEMORAL VEIN TO THE RIGHT VENTRICLE.

IN the *Journal of the American Medical Association* of Feb. 7th Professor H. M. Lyle, of Columbia University, has reported a remarkable case observed by him when in France acting as chief surgeon of the Ambulance d'Annel, Oise. A Zouave, aged 31, was brought to the ambulance. Fours hours previously he had received a perforating shell wound of the left thigh, 4 cm. above the knee, and a penetrating shell wound of the right thigh. Radioscopy of the thigh and lower abdomen failed to reveal any foreign body. Unfortunately the upper abdomen and thorax were not examined. The failure to find the shell fragment was puzzling, as the depth and direction of the wound seemed to preclude the possibility of the particle having fallen out. The patient was in a condition of mild shock. The temperature was 97·2° F., the pulse 126, and the respiration 28. Physical examination of the chest and abdomen was negative. Contused skin was cut away, the wound was laid open, and the projectile track lightly but methodically excised. No foreign bodies were discovered. At the bottom of the wound of the right thigh the femoral vessels were found embedded in a clot; the femoral vein was bruised, but apparently intact. Two Carrel instillation tubes were inserted and 20 c.c. of Dakin's hypochlorite solution were delivered to the wound every two hours. The patient appeared drowsy and slept the greater part of the first two days. On the third day the abdomen became greatly distended, and he complained of pain and tenderness over the spleen and right kidney. The distension was partially relieved by lavage and enemas. Jaundice appeared on the morning of the fourth day, and was accompanied by pain and tenderness over the liver. The temperature rose to 102·2°, the pulse to 132, and the respirations to 32. Fine moist râles were heard at the left base. The area of cardiac dullness increased, a pericardial rub was heard, and the cardiac sounds were indistinct. A provisional diagnosis of general gas bacillus infection with pericarditis and pneumonia was made. In the afternoon there was a temporary improvement, followed by sudden death a little later. Throughout the wound remained sterile. At the necropsy the wound of the right thigh was found to be 10 cm. below and 5 cm. posterior to the anterior superior spine of the ilium. The track led forward, downward, and inward to the femoral vein. In the external wall of the vein there was a small valve-like wound sealed by an organised clot. There was no local evidence of gas infection. Both the lungs were œdematous; there was fibro-purulent pericarditis with free gas in the pericardial cavity. The heart was enlarged, and its external surface was covered with a fibro-purulent exudate. On section the heart showed gaseous crepitation. A rough shell fragment was found free in the cavity of the right ventricle, measuring 1·5 cm. by 0·9 cm. by 0·5 cm., and weighing 1·81 gm. Fibres of clothing were adherent to the irregular surface of the fragment. The liver, spleen, and kidneys were enlarged. On section all yielded gaseous crepitation. There was no obstruction to the gall-bladder or gall-ducts. Evidently the fragment of shell entered the femoral vein and thence migrated to the heart. A radioscopic examination of the chest might have revealed the presence of the shell fragment, which could have been dealt with by operation. Bullets in the cavity of the heart have already been extracted with success in the present war.

THE CLEARING OF THE PAVEMENT.

THE sanitary state of our streets is important, and considerable inconvenience is sometimes caused by the present shortage in the regular service for ensuring it. It ought not to be too much to ask householders, shopkeepers, and others to keep the pavement in front of their holdings swept. The work for each individual would entail neither much time nor energy. If such individual civic responsibility had been insisted upon last Monday in the metropolis after the heavy fall of snow the appalling state of slush on the pavements would have been prevented. As it was, the pedestrian found walking to be both dangerous and uncomfortable, and we have little doubt that a crop of minor accidents occurred through a slip on the pavement. Apart from these, the constant wading through the slush was a real ordeal for the feet, few boots appearing to be proof against its penetrative powers. The pedestrian whom the state of the pavement has cost an illness or an accident may well ask why the obvious remedy is not enforced.

ANTIMENINGITIS INOCULATION.

IN the summer of 1916 a mild epidemic of cerebro-spinal fever occurred in an infantry regiment of over 1200 men at Fredriksstad in Norway. Eight cases occurred, and as isolation of the patients and their contacts seemed ineffective in preventing the spread of the disease Dr. E. Aaser was detailed in August to make a bacteriological investigation of the epidemic. This he did by the microscopical examination of smears, stained by Gram's method, of the naso-pharyngeal mucus

of every man in the regiment. Time and the necessary facilities for any more accurate method of examination were lacking; Dr. Aaser says[1] that he isolated as meningococcus carriers all the men whose naso-pharyngeal mucus contained a large majority of Gram-negative diplococci, and regarded as "doubtful" cases those whose mucus contained a few such diplococci. He found 87 carriers and 70 doubtful cases among the men of the three regimental companies in which cases of cerebro-spinal fever had occurred; no such cases had occurred among the 280 men of the fourth company or among the 100 regimental cyclists, and Dr. Aaser discovered 40 doubtful cases among these, but no meningococcus carriers. To stop the spread of the epidemic it was decided to offer to inoculate every man in the regiment with a meningococcal vaccine. It so chanced that one of the meningococcus carriers, isolated by Dr. Aaser, developed meningitis next day and died. This fact, coupled with fear of the meningococcus carriers, induced all but two or three of the men to be inoculated. The vaccine used was a sterilised emulsion of cultures of eight or ten strains of meningococcus, containing 300 million cocci per c.c.: the dose was 1 c.c. The inoculations were carried through in ten hours. A few of the men had slight chills and headache during the night following the inoculation, but none were seriously incommoded; most had a redness and swelling measuring 3 × 5 cm. at the site of inoculation. Dr. Aaser injected himself with 3 c.c. of the vaccine without any ill-result, and a few days later took a second injection of 4 c.c. equally without any general reaction. The plan had been to give all the men a second inoculation four or five days after the first. There was some unwillingness at this point; but it happened that a general order was issued just then stopping all leave for the rest of the training in the case of those not vaccinated. So all the men received a second inoculation, the dose being 1 c.c. In general this produced more local redness but less local swelling, and a weaker general reaction than the first inoculation. No further case of cerebro-spinal fever occurred in the regiment after this vaccination, during the general autumn manœuvres; but whether *propter* or merely *post hoc* Dr. Aaser does not attempt to decide. He notes that a similar prophylactic anti-meningitis vaccination was carried out in the winter at Tönsberg, 250 men receiving three successive inoculations with 1, 2, and 3 c.c. of meningococcal emulsion, without any harmful result.

[1] Tidsskrift f. d. Norske Laegeforening, Christiania, 1917, xxxvii., 174.

THE CONSERVATION OF MILK.

THE prevention of waste would go far to solve the food problem at the present time, and one of the most promising ways of doing this is by preserving perishable foods. Liquid foods are specially liable to loss and contamination, and should therefore be desiccated. Methods which in the past have been found wasteful may well now prove to be economical in view of shortage and advanced prices. We shall soon arrive at the period of the year when the maximum output of milk is reached, and the waste of this valuable fluid food material is notorious. Its preservation by concentration with the addition of sugar is already severely handicapped by the shortage of the preservative itself, besides which the milk-syrup so produced is not ideal for general food purposes. Milk, of course, can be concentrated without the addition of sugar, but the product cannot be said to be satisfactory, as it is very liable to chemical changes, involving, for example, the precipitation of its milk-sugar and of calcium salts, chiefly in the form of citrate. The desiccation needs to be carried a step further and the whole of the water removed. But there are two difficulties about the complete drying of milk. The first is that if too high a temperature is employed the constitution of the milk is seriously disturbed: the albumins are coagulated, enzymes are destroyed, the fat is separated, and the resulting powder does not re-form an emulsion with anything like the appearance and character of milk. Nevertheless, the product thus obtained possesses a high nutritive value and would save much waste of useful food, particularly in the summer. The water can, however, be easily withdrawn from milk by another process, which consists first in concentrating the fluid at a low temperature in a vacuum pan and then forcing the concentrated milk through a spray producer into a capacious chamber through which flows a current of warmed air. The moisture is thus carried away and a fine dry powder falls, which may be swept out. This product amalgamates perfectly with water, the fluid tasting like fresh milk and having exactly the appearance of the natural emulsion. Moreover, it still shows enzymic activity, the albumins are uncoagulated, the fat is not separated, and caseinogen is still present in unaltered form. But by whatever process dried milk powders are made one great trouble arises: sooner or later the fat deteriorates, becoming partially rancid, and giving the product a repulsive flavour and smell. Even skim milk, retaining as it invariably does a small proportion of fat, deteriorates in the same way sufficiently to make it distasteful after a time. If this problem could be solved there would be no longer any reason for employing fluid milk at all and an enormous economy of valuable food material would be gained. We could then, so to speak, keep the cow in the larder to be drawn upon exactly as domestic necessity arises. The resulting revolution in the supply and distribution of milk would bring substantial gain to the community on many counts.

Dr. Frederick Taylor was re-elected President of the Royal College of Physicians of London on Monday last.

AT the Harveian Society of London, Stafford Rooms, Titchbourne-street, Edgware-road, W. 2, on April 19th, at 8.30 P.M., Dr. P. J. Cammidge will read a paper on the Treatment of Diabetes by Alimentary Rest.

LEICESTER ROYAL INFIRMARY.—The 144th annual report states that during the year 1916 the number of adult in-patients admitted to the civil wards was 2888, as compared with 3082 in the previous year, and of children 545 compared with 616. To the military wards 571 patients were admitted during the year compared with 692 in 1915. The average number of beds occupied was: 190 (civil) and 85 (military). Although the expenditure for the year was heavy—namely, £31,855—it had been met by a generous increase in the ordinary income, the year closing with a small credit balance. The report urges the need for a new pathological department at an estimated cost of £5000 or £6000.

A RECORD OF
61 CASES OF NEOPLASMATA OF THE SKIN TREATED BY X RAYS OR RADIUM.[1]

BY A. A. RUSSELL GREEN, M.B., B.S.LOND., M.R.C.S.,
CAPTAIN, R.A.M.C. (T.); RADIOGRAPHER TO THE FIRST SOUTHERN GENERAL HOSPITAL AND TO THE BIRMINGHAM AND MIDLAND SKIN HOSPITAL.

THE neoplasmata of the skin here reported are all of a malignant character. The writer caused to be circularised every case of this nature which had attended the Electrical Department of the Birmingham Skin Hospital during the last four years, and in the results here set down there has been no selection of cases, some indeed coming for treatment with the knowledge that no permanent benefit could be expected. To 61 inquiries, 41 replies were received, the majority reporting in person.

Table I.—This group of cases, 27 in number out of the 41 whose final history I have traced, represents the cases that have completely healed, two only having relapsed at a later period. Nos. 1 to 20 have been treated with radium, Nos. 21 to 23 have been treated with X rays, and Nos. 24 to 27 have been treated with X rays and radium. With the exception of No. 17, which is Paget's disease of the nipple, and No. 27, which is epithelioma, they are all cases of rodent ulcers. It is a notable feature in this group that in only three instances has any method of filtration been employed. No. 16 was filtered through 0·25 mm. of aluminium and Nos. 21 and 23 through 0·75 mm. of aluminium. It was also noticeable that while in some cases reaction was brought about by the treatment, in others it was absent, and in No. 26, which had several marked reactions under X rays, no improvement took place until radium was applied, and I consider reaction as an incidental rather than an essential part of the curative process.

The view once held that X rays act purely through their destructive effect on the tissues is untenable, as anyone who has seen treatment of ringworm by this means will realise.

One of the points upon which I desired to get evidence was as to whether in cases treated with radium small frequent doses or larger doses at longer intervals were more efficient. An examination of Table I. shows that where the initial exposure was over half an hour, the average duration of treatment was 5½ months, while in those in which it was half an hour or less, the average was 10 months. Of the nine cases treated with small doses six refused to heal until applications varying from three-quarters of an hour to six hours were given; the other three healed under the smaller doses, two have remained healed, the third has relapsed. These three cases healed within three months.

The other case in this group (No. 18) which relapsed was treated by hourly applications of radium, increased later to six hours, and healed in six months. After the relapse the patient was placed under radium treatment again, and while being so treated was painted with liquor hydrarg. nitrat. acid. (not by me), a proceeding which I feel prejudiced his recovery. He is now attending the Radium Institute, and writes to say that his case is considered to be hopeful.

Cases treated by X rays.—The following three cases were treated by X rays:—

No. 21 had pastille doses until she reacted, five such doses in six weeks.

No. 22 had small doses of X rays.

No. 23 had half-pastille doses thrice weekly, 30 applications in all, and in the latter stages of her treatment filtered through 0·75 mm. of aluminium.

Cases treated by radium and X rays.—In all these four cases the essential curative agent has been radium.

No. 24 was treated with small doses of radium 12 minutes thrice weekly, healed in five months, and was given a prophylactic dose of X rays.

No. 25 was treated with X rays for four months without improvement. She was then put on 1-hour doses of radium, and after 16 applications the ulcer healed.

No. 26 was treated with pastille doses weekly, several marked reactions taking place, but no healing resulting. The case ultimately cleared up after the application of radium in ½ to 1-hour doses.

No. 27 was a case of epithelioma of the hand in a man aged 76. This case attended for two and a half years, and the lengthy period of attendance was due to the difficulty experienced in healing the simple ulcer left after the treatment; healing was finally brought about by the application of silver nitrate.

Table II.—Traced unhealed cases.—Of the eight cases treated by radium, three have ceased attendance.

No. 31 by order of the honorary surgeon under whom he first attended.

No. 32 was very irregular, but in any case I should write him down a failure, as he attended for more than six months without any improvement.

No. 35 was healed by X rays eight years ago but relapsed, and while being treated by radium became the subject

TABLE I.—TRACED HEALED CASES.

No.	Age.	Duration of ulcer (years).	Treatment.	Duration of treatment (months).
			Radium.	
1	49	12	97 hrs. 3 to 6 hrs. each.	8
2	63	1	8—6 hrs. 1—8 hrs.	9
3	60	2	4—3 hrs. 8—6 hrs.	3½
4	79	2/12	4—½ hr.	2
5	40	1	4—2 hrs. 4—½ hr.	5½
6	69	¾	32 hrs. 20 mins. to 3 hrs.	12
7	70	1/4/12	7—1 hr.	1
8	66	¼	12 mins. thrice weekly.	3
9	80	2	8½ hrs. 5 to 60 mins.	7
10	60	3	9—6 hrs.	6
11	51	5	6—1 hr.	1
12	66	20	10½ hrs. 10 to 45 mins.	5
13	43	1	16 hrs. 1 hr. thrice weekly.	2
14	49	12	3—6 hrs. 2—4 hrs. 2—1 hr. 1—2 hrs.	3½
15	42	5	12 hrs. 5 to 60 mins.	30
16	42	6	1—3 hrs.	5
17	49	2/12	143. ½ to 6 hrs.	24
18	47	—	1—6 hr.	6
19	60	17	2½ hrs. 5 to 15 mins.	3
20	59	—	4 hrs.	9
			X Rays.—Pastille Doses.	
21	35	3	5 P.	1½
22	77	15	2¼ P.	2
23	68	5	15 P.	4
			X Rays and Radium.	
24	69	2	1 P. 12 mins thrice weekly.	5
25	50	4	26 P. 16 hrs. radium.	18
26	62	20	30 P. 12½ hrs. radium.	33
27	76	30	3½ P. 128 hrs radium.	9

TABLE II.—TRACED UNHEALED CASES.

Note.—In the columns headed "Treatment," where the sign — separates the figures, the first figure indicates the number of applications, and the second figure the duration of such application.

No.	Age.	Duration of ulcer (years).	Treatment.	Duration of treatment (months).
			Radium.	
28	70	10	9 hrs.	1
29	70	3	3—2½ hrs.	2
30	58	3/12	4 hrs.	3
31	55	9	2—1½ hr.	2
32	38	9	37—½ hr. 4—6 hrs. 1—10 hrs.	13
33	58	—	4 hrs.	3
34	73	—	4—¼ hr. 1—12 hrs.	2
35	51	15	Short exp. thrice weekly.	4
			X Rays.—Pastille Doses.	
36	72	1	3½ P.	8
37	47	—	12 P.	3
38	69	17	4—½ P.	4
39	48	—	9 P.	2½
			X Rays and Radium.	
40	72	12	2 P. 92 hrs. radium.	22
41	62	10	3 P. 51 hrs. radium.	17

TABLE III.—UNTRACED CASES, LAST NOTE HEALED.*

No.	Age.	Duration of ulcer (years).	Treatment.	Duration of treatment (months).
			Radium.	
42	55	5	5—6 hrs.	3
43	74	3	5½ hrs. 10 mins thrice weekly.	7
44	60	4½	39—1 hr.	19
45	—	2	3½ hrs. 10 mins. to 1½ hrs.	2
46	64	6	95½ hrs.	28
			X Rays.	
47	—	4	9½ P.	4
48	34	1	9 P.	11
			Radium and X Rays.	
49	69	2½	3 P. 6½ hrs. radium.	2
50	51	1½	50 P. 6 hrs. radium.	19
51	59	9	17 P. 8 hrs. radium.	12
52	47	10	18½ P. 86 hrs. radium.	—
53	57	9	10 P. 9 hrs. radium.	25

* The remaining 8 of this group have no note as to final condition.

TABLE IV.

Of all cases that can be traced 66 per cent. are healed, and have remained healed for the following period:—

Between 3-4 years ...	7	Under 1 year	4
Between 2-3 years ...	4	Relapsed	2
Between 1-2 years ...	9		

Of those treated by:—

Radium	70% healed.
X rays	43% ,,
Radium and x rays	66% ,,

No. 17 was diagnosed as Paget's disease of the nipple; No. 27 as epithelioma of the wrist. All other cases in this table were diagnosed as rodent ulcer.

[1] A report to the Midland Medical Society.

of general enlargement of the lymphatic glands without characteristic blood changes, and ceased to attend.

Of the five still attending, No. 28 is making satisfactory progress. No. 29 is nearly healed.

No. 30 is of some medico-legal interest, especially to radiologists. She is 58 years of age, and has had lupus as long as she can remember. Thirty-five years ago she was treated at the Queen's Hospital, Birmingham, by scraping and caustics, but has had no treatment since. Three months ago she came to my department with an epithelioma arising within the lupus area. Had this case been treated by X rays or radium it would have been cited by the critics of these methods as being due to the treatment. The prognosis is bad in cases of epithelioma arising in lupus, very rapid growth resulting, doubtless due to the high vascularity of the parts.

No. 33 is progressing satisfactorily, and No. 34 is a case too deeply involved to expect any result in treatment.

Of the four cases treated by X rays, No. 36 is improving.

No. 37 is attending the General Hospital, Birmingham, and writes that he is getting much benefit from radium treatment.

No. 38 died from apoplexy during treatment.

No. 39 is a chronic alcoholic and ceased attendance after two and a half months.

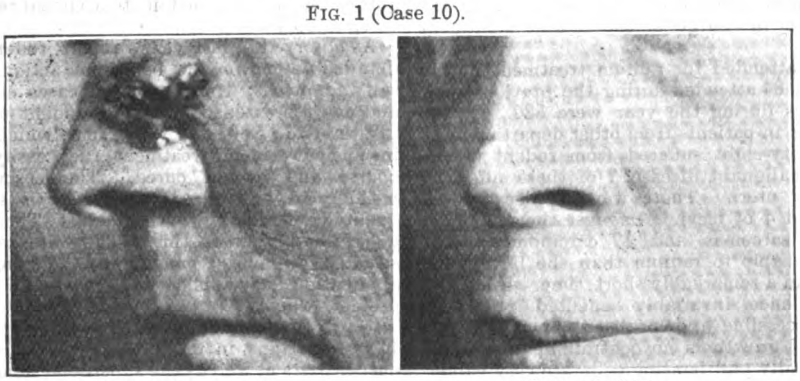
Of the two cases treated by X rays and radium, No. 40 shows that improvement is possible even with such extensive involvement of the deeper tissues.

No. 41, a very extensive case with cicatrisation round the edges, complained of such intense pain after treatment that, having regard to the bad prognosis, I told him to cease to attend.

Table III.—Untraced cases.—I have not discarded the 20 untraced cases, but by examining the out-patient records (facilities for which were courteously placed in my way by the honorary surgeons) I was enabled to arrive at some conclusions concerning them, 60 per cent. being healed. This corresponds pretty nearly with the figure obtained in the traced healed cases which is 66 per cent. Of the unhealed group, four were in an advanced stage of epithelioma when they first attended, the other cases on the table being rodent ulcers.

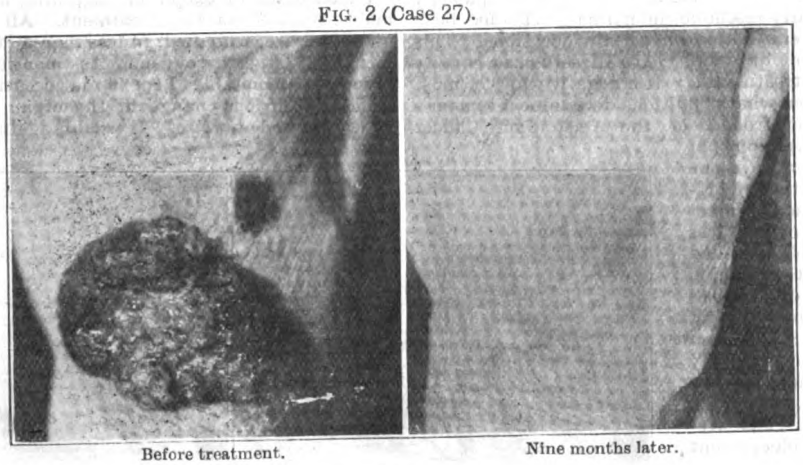
Method of dosage.—The radium in use is pure radium bromide, and is certified as such by the Curie Laboratory. It is spread on metal plates in the proportion of 5 milligrammes to each square centimetre of surface. The X rays were employed as full or fractional Sabouraud doses, this being the quantity of X rays required to bring about the fall of the hair of the scalp without visible reaction, or permanent injury to the hair follicles, and is a sharply defined dose.

FIG. 1 (Case 10).



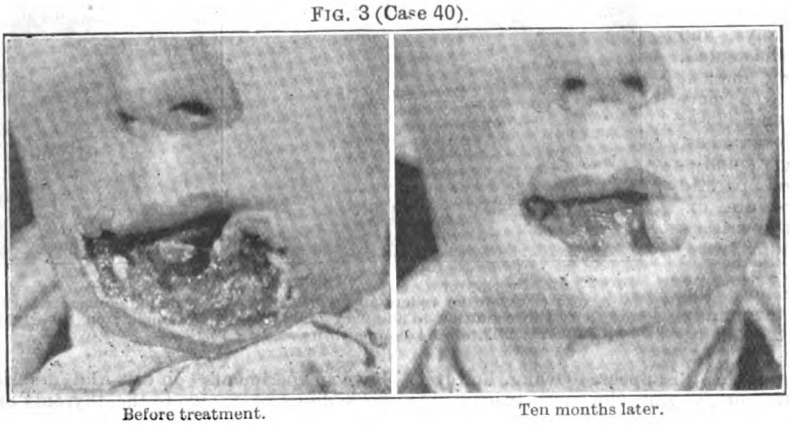
Before treatment. Six months later.

FIG. 2 (Case 27).



Before treatment. Nine months later.

FIG. 3 (Case 40).



Before treatment. Ten months later.

Supplementary treatment.—I have found two methods of supplementary treatment useful. (*a*) Electrolysis for the small nodules that are sometimes left at the periphery of the scar, and which are liable to become centres of subsequent relapse, has proved much more useful to me than the application of carbonic acid snow; in case No. 27, concurrently with the first exhibition of radium, I transfixed the base of the epithelioma with an electric needle in some half dozen places. (*b*) Autogenous vaccines, in cases that have been obstinately septic, I have found of great value.

Table IV. shows the periods for which the patients have remained healed.

Conclusions.

To draw conclusions from so limited a number of cases is, I know, liable to mislead, but so far as these cases go they appear to demonstrate or illustrate that:—

1. The administration of radium in less than one hour doses of the strength specified is likely to prove unsatisfactory, although small doses of X rays and radium will sometimes bring about healing.
2. Radium will heal when X rays have failed.
3. In most superficial cases screening is not necessary.
4. Cases that are going to do well will do so within six months, and if they have not done so within that period a drastic revision of the treatment is imperative.
5. Electrolysis and autogenous vaccines are useful as supplementary methods of treatment.
6. Caustics are contra-indicated.

RADIUM TREATMENT
IN EDINBURGH AND MANCHESTER.

With a Description of
A TROCAR FOR THE INTRODUCTION OF RADIUM TUBES.

ROYAL INFIRMARY, EDINBURGH.

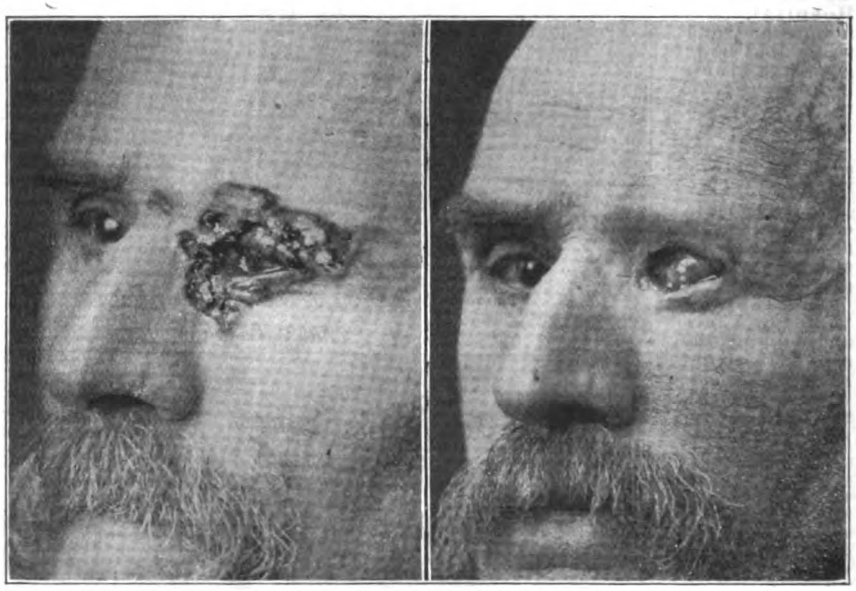
THE following abstract of the report to the managers on radium treatment at the Royal Infirmary, Edinburgh, during the year 1916 has been sent to us for publication by Dr. Dawson Turner, who is in charge of the radium treatment at the infirmary.

Sixty-six patients attended for radium treatment during the past year, whereas 64 attended during the previous year. The total attendances during the year were 520. Of the 66 patients half were in-patients from other departments of the infirmary. Twenty-eight suffered from rodent ulcers, 25 from inoperable malignant disease, 7 of these affecting the vagina or cervix uteri. There were 7 cases of exophthalmic goitre and 4 of nævi. Amongst the malignant cases there were 8 sarcomas and 17 carcinomas. The former are more amenable to radium than the latter, and sometimes disappear in a remarkably short time. They are, in the writer's experience, invariably benefited by radium treatment, and if accessible and localised can be entirely removed. Rapidity of growth is no contraindication to the use of radium, for rapidly proliferating cells are very vulnerable to its radiation; there is, in fact, reason for believing that they are more vulnerable than cells which in morphology and growth more nearly resemble the normal. This has been brought to the writer's notice on certain occasions. This leads to the important question, "Are all sarcomas equally amenable to radium treatment?" If a negative answer must be given to this—then what conditions determine a tumour's sensitiveness? Gaarenstroom, of the Amsterdam Cancer Institute,[1] is of the opinion that the histological structure is the chief criterion and that round-celled sarcomas generally react favourably, spindle-celled less so, and polymorphous-celled least so. He bases this opinion upon an experience of 23 cases treated by the Roentgen rays. He made no use of radium and the effect of radium rays may not be quite the same as the effect of Roentgen rays. At any rate, the writer has frequently had rodent ulcers sent to him for radium treatment which have been treated unavailingly by Roentgen rays, and these rodents radium has cured. This may have been due, it must be admitted, to a more appropriate dosage and closer apposition. Myelosarcomas, lymphosarcomas, large spindle-celled sarcomas, and parotid mixed-celled tumours are extremely sensitive, in the writer's experience, to radium rays. (*Vide* Cases 1, 3, and 10.)

Malignant disease of the vagina and cervix is favourably affected by radium treatment, and epitheliomas, if localised, can confidently be expected to disappear. Owing, however, to the difficulty of efficiently raying the more inaccessible portion of the growth, recurrence in these positions after a longer or shorter period of time is common. This can be again subjected to treatment, but, as a rule, less successfully than the primary growth, and this for two reasons: the one that the recurrence is probably situated in a less accessible position, as in an extension to the broad ligaments; the other that after a course of raying only those cells survive which are refractory to the rays and a recurrence consisting of such cells or daughter cells is less susceptible to attack. There is a tendency by natural selection to breed cells which are immune. The same phenomenon can sometimes, though rarely, be observed in rodent ulcers; an extended ulcer attacking perhaps bone or mucous membrane after repeated raying does not respond at all. In these cervical cases, even though there should be recurrence, the patient has greatly benefited in the meantime by the removal of pain, the cessation of discharges, and the general gain in health and strength. This gain in general health may be striking and equivalent, as some of the continental authorities have termed it, to a virtual resurrection. (Cases 6, 7, and 8.)

As observed in last year's report, rodent ulcers require no detailed notice, for the beneficial action of radium is generally admitted. Uncomplicated cases situated on the skin and not too extensive for the amount of available radium invariably do well. If they recur, which may be due to an insufficient primary treatment, they easily yield to a second course and remain cured. The cosmetic result leaves nothing to be desired, and there is scarcely any subsequent contraction of the skin. The case figured is a good illustration of this. They are less amenable when situated on mucous membrane. Though a single strong application may suffice to remove the rodent, the writer prefers, when it is possible, to divide the necessary dose into two or three administered at three or four days' interval. It is important, in order to prevent a recurrence, that the deeper parts as well as the superficial should receive adequate treatment.

Seven cases of exophthalmic goitre, five females and two males, received radium treatment. All benefited save one, an acute case, who died, in less than a month after the treatment, of hyperthyroidism. As mentioned in last year's report, indisputable benefit is occasioned without any necessary obvious change in the organ, though generally it is diminished in size. I would again draw attention to Rave's experiments[2] on cats and rabbits. He administered large doses of X rays to the thyroids of these animals, and found from subsequent histological examination that no recognisable changes had been produced. Confirmatory results have been obtained by others. It appears, then, that in the thyroid gland we have a structure which, so far as histological examination can carry us, is refractory to X rays. Yet there is ample clinical evidence of the beneficial effects of irradiation in exophthalmic goitre.



A case of extensive rodent ulcer in a man 60 years of age treated with radium. On the left, the condition in January, 1916, before treatment; on the right, the same case in January, 1917, after treatment.

The following are brief notes of the more important cases treated except rodent ulcers, which have been purposely

[1] Archives of Radiology, December, 1916.

[2] Vide Colwell and Russ, Radium and the X Rays, p. 212.

excluded. Reference has also been made to one or two old cases whose progress it has been possible to follow.

CASE 1.—Myelosarcoma of temporal region involving orbital cavity in a male aged 23, recommended by Professor Gulland. Admitted Oct. 17th, 1916. Duration three years. Began by headaches and swelling of jaw. A small operation was performed to remove the swelling. Later a tumour appeared on the right temporal region. On July 7th, 1916, Professor Caird excised a fragment which was found by the pathologist to be a myelosarcoma. Professor Caird refused to operate. On admission there was a prominent swelling over the right temporal region accompanied by shooting pain, difficulty in opening the mouth, and strabismus. An X ray showed that the frontal bone and upper jaw were involved. On Nov. 1st two radium tubes were inserted in Mr. Dowden's absence by Dr. White into the growth, and external radium treatment was also begun. A total dose of 4920 mgh. was administered. In a week's time the growth had diminished in size, the headache was better, and the jaw freer. On Nov. 28th, 1916, there was no squint and no pain. Professor Gulland examined him and wrote: "I was delighted to see the patient to-day and to find that he had improved so very greatly. He looks immensely better, and I see no reason why he should not start work." On Jan. 23rd, 1917, he continued quite well.

CASE 2.—Scirrhus in a female aged 59, recommended by Dr. David Huskie. Admitted Nov. 28th, 1916. A year ago Professor Caird removed patient's left breast for scirrhus. In the line of the scar there is an ulceration with hard borders. It has been burned by Dr. Huskie three times. This ulcer was given a dose of 205 mgh. during a fortnight. A week later Mr. Jardine examined her and wrote, "Result very successful, no more need for treatment." The ulcer and hardness had disappeared. Warned patient to report herself regularly to Dr. Huskie.

CASE 3.—Recurrent sarcoma (old case) in a female aged 49, recommended by Dr. Maclagan. Duration four years. Several operations for the removal of the growth without success. Admitted by Mr. Miles on July 15th, 1915. Now a large nodular mass projecting in the left suborbital region and adherent to the maxilla. Pathological report, large spindle-celled sarcoma. As Mr. Miles considered the tumour inoperable radium treatment was commenced. By internal and external applications a dose of 5880 mgh. was given. In November, 1915, she was readmitted. There was now an ulcerating mass closing the left eye, the mass was so friable that it was difficult to keep tubes embedded, but by external treatment a dose of 5180 mgh. was given. During these applications the growth diminished markedly. On Feb. 1st, 1916, the tumour had greatly shrunk and was moveable; it had been fixed before. Patient better and stronger and can see normally. The condition had so much improved that Mr. Miles removed what was left of the growth, and further radium treatment was commenced. A dose of 4120 mgh. was given as a prophylactic against recurrence. On Nov. 23rd, 1916, the growth had disappeared, an area of dead bone was visible, the skin around healthy. Mr. Miles could detect no sign of recurrence.

CASE 4.—Sarcoma involving lower ribs on right side in a male aged 44, recommended by Mr. Dowden. Admitted May 15th, 1916. Duration about 18 months. On account of a swelling in the region indicated the patient attended the surgical out-patient department of the Royal Infirmary in October, 1915, and Mr. Jardine scraped the interior of the growth. The pathologist reported that the growth was a sarcoma. The growth never went quite away, and on April 25th, 1916, the patient was admitted to Mr. Dowden's wards. The tumour was now increasing, and as Mr. Dowden was of opinion that an operation would be an extremely severe one he thought that radium might be tried. Over the growth there was a cyst containing blood. Radium treatment was now begun. Three tubes of radium were inserted into the substance of the growth and a total dose of 7560 mhg. was administered. On June 14th there was considerable external swelling and discharge. On July 20th the external swelling was less, but there was more pain. The patient reported himself at regular intervals and appeared to be gaining strength, for on Nov. 21st, 1916, he asked permission to resume his work as a brass finisher. This Mr. Dowden permitted him to do. On Jan. 2nd, 1917, he was well and hard at work, but above the original growth there was a hard tumour mass, which Mr. Dowden had noticed before.

CASE 5.—Myeloma in a female aged 23, recommended by Mr. Dowden. History: Two years ago patient complained of a gumboil on the right side of the superior maxilla. Dr. Gibbs found a growth and recommended her to consult Mr. Dowden. The latter scraped out the cavity and the pathologist reported the growth to be a myeloma. It lay posterior to the superior maxillary bone. As a prophylactic radium treatment was recommended, a tube of radium was attached to a wire and passed up into the cavity, and a dose of 1920 mgh. administered. This was in October, 1915. In February, 1916, there was no trace of a recurrence, but when the patient reported herself in June, 1916, Mr. Dowden found that the disease had returned. O June 27th Mr. Dowden scraped out the cavity and inserted radium tubes, at first three, but on one coming out only two were kept in. A dose of 4400 mgh. was now given, more than double the dose she was given the first time. Precautions were also taken to attempt to maintain the radium in a more effective position. Very severe reaction followed with swelling and pain, which required constant opiates, the tongue and mucous membrane of the cheek being burned. In December the patient was much better, and on Jan. 2nd, 1917, Mr. Dowden could find no trace of a recurrence.

CASE 6.—Sarcoma of cervix in a patient aged 47, recommended by Dr. Barbour. Admitted July 20th, 1916. Duration one year. Complains of a bearing-down pain and some discharge. On June 26th, 1916, the cervix, found to be ulcerated by Dr. Fordyce, was curetted. Pathological report, sarcoma. Dr. Barbour examined her on July 20th, 1916, and found hard nodules all round the cervix except posteriorly. The right ligament was thickened. Body of uterus unaffected. Hysterectomy unsuitable. A dose of 4300 mgh. of radium was given. Sept. 26th, 1916: Examined by Dr. Fordyce. Condition very satisfactory, there being no trace now of the indurated nodules, but cicatrisation instead. Nov. 14th, 1916: Parts seemed quite healthy; no discharge; patient much stronger. Weight 8 st. 1½ lb. Feb. 1st, 1917: The patient was examined and the parts found to be *in statu quo*.

CASE 7.—Squamous epithelioma growing from vaginal roof behind and to left of cervix in a patient aged 63, recommended by Dr. Orr and Dr. W. Fordyce. Admitted Oct. 16th, 1916. There is a soft fungating gangrenous mass of the size of a Victoria plum occupying the above position. This was removed by operation and the base of it thoroughly scraped and pure carbolic acid applied. Pathologist report: Squamous epithelioma showing marked necrosis. Ten days later the mass had grown again to half its previous size; very fœtid discharge; some necrosis. The mass was again removed and radium applied to base and a dose of 4900 mgh. administered. Jan. 11th, 1917: Dr. Orr writes, "There is to-day nothing to be felt except a cicatrix and the least suspicion of ulceration, perhaps the size of a green pea, at one point of the cicatrix. The patient feels and looks well and the result so far is very gratifying."

CASE 8.—Epithelioma of the cervix. (An old case.) Patient, aged 30, recommended by Dr. Brewis. Admitted July 6th, 1915. Complaint of loss of health and reddish-brown discharge. Cervix widely involved; uterus fixed. After curetting a dose of 6720 mgh. of radium. Sept. 30th: Patient much better. Pain disappeared. Cervical cavity smaller, granulations superficial, a scraping still showed squamous epithelioma cells. Uterus movable. In consequence of pathological report a dose of 1920 mgh. was given. Feb. 3rd, 1916: Patient greatly improved, looks another woman. July 20th, 1916: Quite well. Uterus shrivelled, replaced by granulation tissue. Pathologist's report from a scraping. Nov. 16, 1916: Returned to ward, complaining of continuous pain in right leg. Examined by Dr. Brewis under chloroform. Cannot feel cervix or body of uterus, but to the right there was a hard mass in the position of the broad ligament extending back to the sciatic notch of the bone. The mass is a good size and fixed. A scraping showed malignant cells. A dose of 6,500 mgh. of radium was administered. Dec. 14th, 1916: Rise of temperature. Examination showed that the opening to the cavity was blocked. A drainage-tube was introduced. Jan. 15th, 1917: A slough came away. Temperature still rises but less, pain also less and only felt at night. Patient remains in a prostrate condition, due to the disease and to the destruction produced by the radium. Feb. 2nd, 1917: Patient remains *in statu quo*.

CASE 9.—Chondro fibro-sarcoma in a boy, aged 6, recommended by Dr. J. S. Fraser. Admitted May 9th, 1916. The disease affected the left maxillary antrum, causing protrusion of the cheek, diplopia, and proptosis. Dr. Fraser removed as much as was possible of the growth by scraping, but fearing that he had not eradicated it consulted with Mr. Dowden with a view to the removal of the left superior maxilla. Mr. Dowden, however, was of opinion that the case was more suitable for radium. Tubes of radium were introduced through an opening into the mouth and a dose of 1440 mgh. administered. The patient was examined on Jan. 3rd, 1917, by Dr. Garretson, in the absence of Dr. Fraser, and he was unable to detect any sign of the disease. The boy appears to be perfectly well and is attending school.

CASE 10.—Myeloma of the sternum (old case) in a male aged 23, recommended by Professor Gulland. Admitted March 9th, 1915. Duration two years. Growth the size of a large cocoanut adherent to sternum. Symptoms: weakness and dyspnœa. Consultation with Mr. Miles, who considered the case inoperable. Four radium tubes were introduced by Mr. Miles into the growth and radium was also applied externally. A dose of 13,200 mgh. was administered. Within a month of this treatment the growth had entirely disappeared. Professor Gulland remarked, in regard to this case, "that he had watched the tumour growing during the past 18 months, that it was of very large size, quite as big as two fists, that he had been rather a sceptic as regards the value of radium in malignant disease, but that he was now quite converted. The growth was a myeloid sarcoma." The patient recovered his health and strength and went back to work. Six months' later a small recurrence appeared over the sternum. After a dose of 250 mgh. it disappeared, but was followed by an ulcer about 1 inch deep extending into the eroded sternum. No pain was associated with the ulcer, which slowly filled up. The patient had a course of iodide of potassium on Mr. Miles's advice. The patient was able to continue with his work. On Jan. 13th, 1916, Professor Gulland wrote: "This patient had a long course of inunction and of iodide of potassium before the radium treatment, but without the slightest effect. The ulcer has impressed me more as a continued destruction of the tumour, which must have started from the centre of the sternum." The foregoing appeared in last year's annual report. The further history is as follows. In February, 1916, a swelling occurred in the left axilla, which was removed by Mr. Miles in March 1916. The pathologist's report was the following: "A difficult growth to classify. There is a large amount of well-developed fibrous tissue. The cells have a tendency to arrange themselves in rounded follicles. They are polygonal in shape and suggest endothelial cells in appearance and arrangement. The condition I regard as a tumour formation belonging to the group of the lymphosarcomata but somewhat anomalous in character." Oct. 26th, 1916: The ulcer on the sternum is quite healed and the patient perfectly well.

MANCHESTER AND DISTRICT RADIUM INSTITUTE.

A report of the work of the Manchester and District Radium Institute (the Royal Infirmary, Manchester), by Dr. Arthur Burrows, the radiologist to the institute, deals with the period from Jan. 1st to Dec. 31st, 1916, which saw the completion of the first thousand cases presenting themselves with a view to radium treatment during the two years since the institute was started. Included in the report, in addition to a general table of all the cases which have been treated, is a list of all the malignant cases, excepting rodent ulcers, which were well at the end of 1916. This list states the time during which the patients have remained free from symptoms or signs of disease. No case of carcinoma of the breast was reported as being apparently well at the end of 1915, and therefore, in this particular instance, 12 months is the maximum period during which any patient previously

suffering from the disease can have been free from symptoms. During the year the energies of the institute have been limited to the purely clinical side of its work; but it is hoped that as soon as circumstances permit an increase in the scope of its activities will be possible. The physicist, Mr. Lupton, reports that 777 ordinary emanation tubes, 238 emanation tubes for needles, and 316 flat emanation applicators were made during the past year in the physical laboratory, showing an increase of 251 over the year 1915.

A series of cases illustrating interesting points in relationship to radium treatment is given, and two groups of these may stimulate the reader's interest to read the report itself.

Carcinoma of the breast.—In this instance the best results follow the implantation of an adequate number of emanation tubes in the growth and along the course of the lymphatic vessels. In some cases as many as 12 tubes have been buried at one time. If the tumour be very firmly fixed to the chest wall the results are not so good, and treatment by implantation must be employed with extreme caution or the breaking down of the growth may produce an intractable ulcer. Often it is better not to bury at all under these circumstances, but simply to apply plates externally. It is always necessary to convince oneself that the situation and size of the growth give adequate opportunities for local repair. If the growth of the breast be too large, it is best to remove it locally and to apply radium at the site of removal and along the lymphatic tract. Radium is also most useful in assisting surgeons to operate in border-line cases or for the treatment of inoperable glands of the neck. Small scattered glands of the neck may be treated by the application of plates or larger masses by the method of burying. In the latter instance the results are often most gratifying. Small secondary skin nodules often disappear when treated by superficial plates, but their widespread nature inclines one to think that it is likely that X ray treatment would be the best method of dealing with them in the future. It is by no means always necessary to produce a severe local reaction in order to remove a malignant growth by radium. It is often done without the patient's knowledge that anything is happening at all, and increase of knowledge will, no doubt, practically eliminate the occurrence of a reaction which is a source of discomfort to the patient.

CASE 1.—Female, aged 72. This patient had a two years' history of a swelling of the right breast with the formation of a lump in the right axilla. She had only slight symptoms of discomfort. Her surgeon deemed her growth to be inoperable. In the upper and outer quadrant of the right breast was a hard mass the size of a hen's egg. It was adherent to the skin, but could be moved somewhat on the chest wall. In the right axilla was a mass of six or more hard glands adherent to one another. Slight movement of them in the deep tissues was possible. Five radium emanation tubes (each of 20 mc. strength and contained in screens of platinum 3/10 mm. thick) were buried in the breast (three) and axilla (two) for 24 hours. The growth diminished much, and treatment was repeated two months later with four tubes. Three months later some indefinite thickening remained in the right breast, one gland could be felt in the right axilla, and one small supraclavicular gland had appeared. Treatment was continued by the external application of radium plates, screened by 1·5 mm. of lead, for 24 hours. This was repeated six weeks later, and seven months after the first application of radium all signs of the growth had disappeared.

The above is an example which shows how much perseverance is sometimes necessary. Other cases have cleared up more quickly, and it has not been necessary to apply plates.

CASE 2.—Female, aged 50. In 1913 radical amputation of this patient's right breast was performed for carcinoma. Twelve months later a nodule appeared at the inner end of the scar. The nodule gradually grew, and eventually broke down and ulcerated. When she presented herself with a view to radium treatment, she had at the sternal end of the breast scar an elliptical ulcer 3 × 2 cm. It was surrounded by a zone of infiltration measuring 1 cm. across, and its edges were thickened, hard, and undermined. The whole ulcer was intimately united with, and fixed to, the chest wall. In the neck above the inner end of the clavicle was a hard rounded gland the size of a hazel nut. It was not firmly fixed. No enlarged glands could be felt elsewhere. Looking to the nature and situation of the ulcer it was decided that treatment by external plates was the only method available. The patient received nine applications of plates of a strength of 2·5 mg. of radium to the square centimetre, screened by 5 mm. of platinum, for 25 hours, both to gland and ulcer, an interval of six weeks elapsing between each application. At the end of that period both the gland and the ulcer had disappeared, leaving no sign of the growth.

The above example shows that occasionally a good result may be obtained in an apparently unpromising case by the use of plates alone.

Tumours of abdominal muscle.—The three cases hereunder noted are all interesting from the point of view of diagnosis and radium treatment. The first case is one of true sarcoma of the left rectus, the other two are examples of fibrosis of the abdominal muscles and chronic interstitial myositis respectively. The case of sarcoma yielded very slowly to radium treatment, while the other two cleared up extremely rapidly.

CASE 1.—Female, aged 29. In September, 1915, this patient came to the Manchester Royal Infirmary for treatment of a hard growth about 15 cm. long and 7 cm. wide in the upper part of the left rectus abdominis. The surgeon made an exploratory incision, and a piece of the growth was removed for microscopic examination; it proved to be a myxo-fibro-sarcoma. On one occasion three tubes of radium emanation, each of a strength of 20 mc. and screened by 1 mm. of silver, were inserted into the growth for 24 hours. A considerable reduction in the size of the tumour resulted. It was then decided to continue the treatment entirely by means of heavily screened radium plates applied externally for periods of 25 hours. The patient has had nine such treatments, and the growth has slowly decreased in size until at present all that can be palpated is a small elongated patch of thickening. The treatment has thus been continued over a period of 14 months.

CASE 2.—Male, aged 42. This patient was operated on by a surgeon with a view to removing the tumour of the abdominal wall occupying practically the whole of the abdominal muscle to the right of the middle line, and from the level of the umbilicus downwards. At the time a piece of the growth only was removed for section, but no further operation was performed. The section under the microscope showed extensive fibrosis of muscle, which suggested syphilis, but the Wassermann reaction was negative. Two emanation plates, each containing 28 mc. of radium emanation and screened by 1·5 mm. of lead, were applied to the growth for 24 hours. Two months later no thickening whatever remained, and no recurrence of the growth has taken place, although 21 months have elapsed since the treatment was applied.

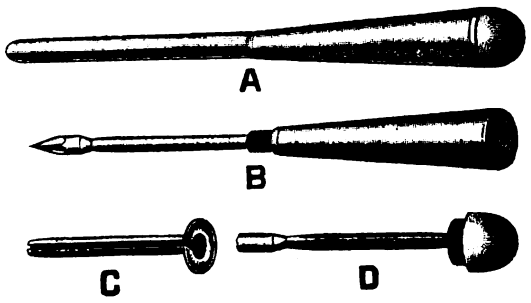
CASE 3.—Male, aged 40. This patient came to the Royal Infirmary in January, 1915. He had then five weeks' history of swelling of the left thigh and pain down the front of the thigh and leg. A large hard, fixed growth could be felt in front of the upper part of the left femur. It was hard, elliptical in shape, and about 15 cm. long. An exploratory incision was made over the tumour, and three emanation tubes containing 80 mc. of emanation were buried in it. A piece was removed for microscopic examination. The section showed the case to be one of chronic interstitial myositis. The growth rapidly became smaller, and the patient has now been free of signs and symptoms for nearly two years.

The classified results at the end of the year were as follows:—

Free of disease at the end of the year	105	Too early to note result	34
Improved	317	Prophylaxis	20
Not improved	216	Not treated	127
Abandoned treatment	91	Total	1000
Died from their disease	90		

A TROCAR FOR THE INTRODUCTION OF RADIUM TUBES.

The accompanying illustration shows an instrument which Dr. Arthur Burrows has devised for introducing radium and radium emanation tubes into tumours when there is no danger of perforating important structures. It consists of a sharp trocar (B), a cannula with a slot running its whole length (C), and a blunt trocar (D). The sharp trocar and the cannula are thrust into the growth to the required depth, and the trocar is withdrawn in the usual manner. The radium tube is then inserted in the cannula, and its silk attachment for withdrawal is slipped



into the slot. Next the blunt trocar pushes the tube home. The cannula is then pulled up along the trocar, and its lower end and the silk are thus completely disengaged, and the trocar and cannula are withdrawn leaving the tube in position. The process is quick and practically no scar remains. The component parts of the introducer screw together into a compact whole as in A. The internal diameter of the cannula is 3 mm. The instrument has been made for Dr. Burrows by Messrs. James Woolley, Sons, and Company, Limited, of Manchester.

Colonel George Henry Barefoot, C.B., C.M.G., A.M.S., has been appointed a Knight of Grace of the Order of St. John of Jerusalem.

MEDICINE AND THE LAW.

The Supervision of Poisons.

THE sentence to various terms of penal servitude of three out of the four persons who were recently charged at the Old Bailey with conspiring to murder two Cabinet Ministers brought to a fitting conclusion a story of rancorous plotting against persons in authority, of perverted ingenuity, and of fatuous recklessness, such as we are accustomed to associate with the cruder novel of crime or with cinematograph exhibitions. The sheer improbability of many of the events might have led to acquittal if the prosecution had relied only on the reported conversations of the accused, but the discovery in the possession of one of them of substantial amounts of deadly poisons, and the most ample evidence that these poisons had been provided by another of them, placed their individual and combined guilt outside the range of doubt. We do not propose to comment upon the details of the schemes developed by the Wheeldons in their conversations with the detectives whose astuteness, combined, it would seem, with good fortune, brought them upon the spot at precisely the right moment for effective action. To do so with any point would be to suggest where the proposals for murder made by the plotters might have failed or been improved. But to one thing we call attention, and not for the first time. The poison in the possession of these persons of dangerous character was deadly if they were skilful enough to use it. The fact that in this instance it might have been employed to strike a shrewd blow at the country's safety should strengthen the hands of magistrates in all cases in which irregularity in the sale of poisons is proved. The regulations governing such sales, however strictly enforced, cannot be expected to prevent altogether the obtaining of poisons by the criminal, but they can, no doubt, do much to limit the amount thus accessible and to render its acquirement difficult. The precautions taken to prevent the surreptitious abstraction of drugs and dangerous substances from hospitals and institutions, where they are legitimately stored and handled daily, cannot be expected to prevent all pilfering by persons unfit for the trust reposed in them, but the example of Mason should call attention to the necessity for the rigorous employment of such precautions, and more particularly so at a time when assistants are being employed as to whose antecedents and characters there may be no trustworthy information. The element of doubt which is sometimes found in trials where poisons form the subject of expert evidence seemed entirely absent in this case. The prosecution had it all their own way, and the notice of appeal which was lodged has been dismissed.

The Sale of Arsenic.

By an Act of Parliament passed in 1851 (14 & 15 Vict., c. 13), among the restrictions laid down to regulate the sale of arsenic, it is ordered that no one shall sell it "to any person who is unknown to the person selling," unless the sale is made in the presence of a third party who is known to both vendor and purchaser. In a recent prosecution brought under this Act by the police at Slough against a druggist, it appeared that no legal decision has been given as to the interpretation of the expression "unknown." The druggist, who was stated to have conducted his business blamelessly for 17 years, in this case sold a small quantity of arsenic to an Australian soldier whom he had seen going about in the district for about a fortnight and who had previously made a purchase at his shop. The soldier had stated that he wanted the arsenic in order to cure a fox-skin. The druggist observed that it should be mixed with soap for that purpose, and on account of the use to which it was to be put sold the small quantity required, without mixing it with soot or indigo, as ordered by the Act referred to. Otherwise the sale was concluded with regularity. The soldier was afterwards apprehended as an absentee from his regiment and the arsenic was found upon him. When the question came to be argued, whether in the circumstances the purchaser of the poison was known or unknown to the vendor, it was stated that a stipendiary magistrate at Manchester had held in 1887, in a similar case, that the onus of proof lay upon the defendant; while, on the other hand, at Salford in 1889, the bench had decided that it was for the prosecution to prove that the purchaser was unknown to the druggist. The Slough magistrates appear to have taken the view that the sale in the circumstances described constituted a sale to a person unknown to the druggist, for they inflicted a fine of £1 upon that charge and £2 upon a further charge of selling arsenic in less quantity than 10 pounds.

A Case for Diagnosis.

In a case recently tried at the Brighton county court the question arose whether the plaintiff suffered in the autumn of last year from ptomaine poisoning as the result of eating a pork-pie, or whether his illness was an attack of gastro-intestinal influenza following a visit to a picture house. The plaintiff, who had been staying at a home of rest in the neighbourhood, visited a picture house in Brighton, and on returning to the station purchased at defendant's shop a pork-pie which he "washed down with a dry ginger." A friend also bought a pie, but according to the evidence only ate the crust, throwing the meat away. The friend was not taken ill, but the plaintiff's indisposition necessitated a prolonged stay at the home of rest. Two doctors were called to give evidence on each side. Judge Mackarness, commenting on the medical evidence, said that one thing the four doctors were all agreed upon was that in the absence of an analysis of the excreta it was not possible to speak with absolute certainty as to ptomaine poisoning. Unfortunately no such analysis was made. It seemed, he said, quite possible from the medical evidence that the plaintiff might have developed influenza during his visit to Brighton, but in his opinion the medical evidence pointed to ptomaine poisoning as a very probable cause of the plaintiff's illness. He commented on the fact that there were no other sufferers among the many purchasers from the same shop on the same day, and said that it would not be right that plaintiff's misfortune should be visited on the head of defendant unless the evidence clearly established that the pork-pie was unfit for human food and was the cause of his illness. The evidence fell short of that and he gave judgment for the defendant.

THE CONTROL OF VENEREAL DISEASES.

Approved Council Schemes.

REPLYING to a question in the House of Commons on March 12th, Mr. Hayes Fisher, Parliamentary Secretary to the Local Government Board, stated that 20 local authorities in England had provided facilities for the free treatment of venereal diseases in 28 hospitals. The number of councils whose schemes have been approved by the Board is now 60, the list being as follows:—

County Councils.—Buckinghamshire, Cambridgeshire, Derbyshire, Durham, Isle of Ely, Essex, Gloucestershire, Herefordshire, Hertford, shire, Kent, Leicestershire, County of London, Middlesex, Norfolk, Northamptonshire, Northumberland, Nottinghamshire, Pembrokeshire, Peterborough (Soke of), Radnorshire, Rutland, Salop, Suffolk East, Surrey, Sussex East, Sussex West, Warwickshire, Westmorland, Wiltshire, Worcestershire, Yorkshire (East Riding).

Town Councils.—Bath, Birmingham, Blackpool, Bootle, Bradford, Brighton, Cardiff, Croydon, Dewsbury, East Ham, Hastings, Ipswich, Kingston-on-Hull, Leeds, Leicester, London (City of), Merthyr Tydfil, Middlesbrough, Newcastle-upon-Tyne, Northampton, Nottingham, Portsmouth, Salford, South Shields, Tynemouth, Wallasey, Warrington, West Ham, York.

In the case of Rutland County Council and Blackpool town council full schemes have been submitted, but they are at present approved for laboratory facilities only. Merthyr Tydfil, Middlesbrough, and York town councils have only submitted partial schemes for laboratory facilities and supply of salvarsan substitutes, and these have been approved. There remain at present 85 local authorities who have not yet presented schemes, or whose schemes have not yet been approved by the Local Government Board.

The Participation of Hospitals.

A White Paper issued by H.M. Stationery Office [CD 8509, price 1*d.*] states that between 130 and 140 hospitals in England and Wales have expressed their willingness to participate in the schemes of local authorities, and although in a few instances the authorities of important hospitals have been reluctant to inaugurate during the war any fresh arrangements for the treatment of venereal diseases, this hesitation has already been overcome in some cases. The shortage of medical staff and the pressure on the accommodation at most hospitals at the present time have presented obstacles in many instances, but the former difficulty has been met to some extent by the Army Council arranging that

certain officers of the R.A.M.C., who are specially skilled in the treatment of venereal diseases, should devote part of their time to the work of the clinics provided at general hospitals for the treatment of these diseases.

Treatment at Lambeth Infirmary.

Mr. A. L. Baly, in a report upon the treatment of venereal disease at Lambeth Infirmary, mentions that all the assistant medical officers are trained to administer galyl intravenously and grey oil intramuscularly, and during the nine months ended Dec. 31st last 395 injections of the former have been given without a single untoward effect. In some cases it has been found desirable to give more than three injections of galyl, and the number of patients presenting themselves for mercurial treatment has risen very considerably. When desirable, patients are advised to remain in the infirmary until all infective lesions have disappeared; on the other hand, an increasing number of patients are admitted for week-ends to receive their injections. Very few men suffering from acute gonorrhœa apply for admission. When admitted they receive the most modern treatment, but the ward in which they are at present accommodated is of a temporary character. In regard to gonorrhœa in the female, many of the cases admitted being already in a confirmed and chronic stage, only prolonged and vigorous in-patient treatment appears to give satisfactory results. The pathological work of the infirmary has grown to such an extent as to occupy the whole time of one of the assistants, who is an expert pathologist. Mr. Baly suggests that examination for specific organisms should be made in the infirmary laboratory, as well as the Wassermann reactions for examinations made for diagnostic purposes in connexion with tabes, cerebral syphilis, aneurysm, and other late manifestations, and a grant claimed in respect of infective cases. For the purpose of claiming Government grants, he says:—

It may be necessary to compile records showing the number of days during which patients are maintained in the infirmary suffering from venereal disease during the infective stage, apart from their maintenance for any other cause or for a continuation of their treatment after the infective stage has passed. I propose this should be done by keeping a special index card which will show (1) date of admission; (2) the date on which, in the medical officer's opinion, the patient ceased to be infective; (3) the number of days so maintained. I suggest that the latter date (2) should be determined by the cessation of any infective discharge and the healing of all infective lesions, and in the case of gonorrhœa, when the gonococcus can no longer be found by microscopic examination. I propose that the guardians should claim a grant under the following conditions: (i.) Primary syphilis; (ii.) all recognised secondary syphilitic conditions; (iii.) rupia; (iv.) congenital syphilis when associated with infective lesions; (v.) all forms of gonorrhœa, excluding ophthalmia neonatorum, in which an infective discharge is present as demonstrated by the presence of the gonococcus.

The Coöperation of the General Practitioner.

In connexion with the public provision for diagnosis and treatment of venereal diseases, the Local Medical Committee for the County of London calls attention to the new clause which has this year been added to the panel practitioner's agreement:—

Where the condition of the patient is such as to require services beyond the competence of an ordinary practitioner, the practitioner shall advise the patient as to the steps which should be taken in order to obtain such treatment as his condition requires and shall, where provision is made for such services in or for the area, by any public authority, after consultation with the Local Medical Committee, and due notice of such provision has been given to the practitioner by the Insurance Committee, take such other steps as may be reasonably necessary, in order that the patient may derive full advantage from the provision of such services; Provided that where, for the purpose of defining the duties of practitioners as aforesaid, a scheme has been prepared by the Panel Committee in consultation with the Insurance Committee and approved by the Commissioners, the provision of any such scheme shall be deemed to be part of the agreement and shall be substituted for this clause.

As the public provision now made is available for every member of the community, and general practitioners can assist their patients to derive full advantage from the provision by drawing their attention to the times of attendance at the various hospitals, the Local Medical Committee does not consider it necessary, at any rate for the present, for the Panel Committee to put forward any such scheme. On the other hand, the Local Medical Committee emphasises the need for individual judgment:—

At the outset every practitioner should recognise his individual responsibility to exercise his own personal judgment with regard to the nature of any form of treatment to which he advises or encourages his patient to submit. A practitioner cannot send a patient to special clinics with a definite expectation that any particular form of treatment, such, for example, as injections of salvarsan, shall be adopted. It must rest with the member of the staff responsible for the case to use his own judgment as to the general value of salvarsan or any similar drug and as to its applicability in the particular case. In the same way, the authorities of the hospital, in referring a case to a general practitioner, cannot dictate the form of treatment to be applied. The general practitioner must exercise his own discretion as to the form of treatment which in his hands he believes will be most beneficial to his patient.

The Local Medical Committee emphasises the fact that salvarsan is on its trial, and that those who are making the freest use of it differ amongst themselves as to the indications for its use, its mode of administration, its dosage, and its dangers, and adds that it would be greatly to the public interest if the Medical Research Committee were able to make investigations into some of the difficult questions connected with the limitations of the use of salvarsan and the trustworthiness of the Wassermann reaction and to issue a report thereon. The Local Medical Committee considers that it is the duty of every practitioner to take such opportunities as may be available of learning at first hand from those with large experience the details of the modern treatment of syphilis, and that no blame can possibly be attached to a practitioner who, having given careful consideration to the requirements of a patient under his care, decides not to adopt or recommend any particular form of treatment.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

To be Temporary Surgeon: William F. W. Betenson.

The following appointments have been notified:—

Fleet-Surgeons: J. D. Hughes to Devonport Dockyard; W. R. Trythall to *Téméraire*; and A. R. Schofield to *President*, additional.

Staff-Surgeon: G. T. Verry to Southampton

Temporary Surgeons: B. W. Dakers to *Pembroke*, additional; H. S. Brown to R.M. Depôt, Deal; E. H. Hugo to Gibraltar; and W. F. W. Betenson to *Victory*, additional, for Haslar Hospital.

ARMY MEDICAL SERVICES.

TERRITORIAL FORCE.

Major H. A. Howes to be Deputy Assistant Director of Medica Services.

ROYAL ARMY MEDICAL CORPS.

Majors relinquishing the acting rank of Lieutenant-Colonel on re-posting: J. Fairbairn, R. P. Lewis.

Major J. W. West to be acting Lieutenant-Colonel whilst commanding a General Hospital.

To be acting Lieutenant-Colonels whilst commanding a Field Ambulance: Major J. Powell Capts. (acting Majors) P. G. M. Elvery, G. F. Rudkin, C. L. Franklin, A. D. O'Carroll, G. H. Stevenson, P. S. Tomlinson, B. Johnson, E. M. Middleton, and Temp. Capt. (acting Major) C. V. Bulstrode.

TERRITORIAL FORCE.

Major H. A. Howes is seconded whilst holding an appointment as Deputy Assistant Director of Medical Services.

Lieuts. J. Fraser and H. W. Beedham to be Captains. G. Bryce to be Lieutenant.

TERRITORIAL FORCE RESERVE.

Lieut.-Col. J. T. R. Wilson, D.S.O., from Royal Scots, to be Lieutenant-Colonel.

Capt. A. Findlater, D.S.O., from London Mounted Brigade Field Ambulance, to be Captain.

VOLUNTEER FORCE.

B. J. Wood, 5th Battalion Kent Volunteer Regiment, to be temporary Lieutenant and Medical Officer.

E Ellis, 8th Battalion Yorkshire West Riding Volunteer Regiment (late Second Lieutenant 1st V.B. West Riding Regiment), to be temporary Lieutenant and Medical Officer.

G. Hollies, 1st Battalion Shropshire Volunteer Regiment (late Lieutenant-Colonel, R.A.M.C.), to be temporary Captain and Medical Officer.

T. W. Dewar, 2nd Battalion Perthshire Volunteer Regiment, to be temporary Lieutenant and Medical Officer.

SERVICE NEWSPAPERS' AMALGAMATION.

The *Army and Navy Gazette* and the *Broad Arrow* will, on April 21st, be incorporated under the one title. *The Army and Navy Gazette, the Broad Arrow, and the Naval and Military Gazette.*

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

The March issue of this journal opens with an analysis by Colonel Sir William B. Leishman and Major A. B. Smallman of Recent Cases of Tetanus in the British Expeditionary Force, with special reference to their treatment by antitoxins. Some of the tables illustrating the article are remodelled upon those adopted by Sir David Bruce in an article published in THE LANCET of Dec. 2nd, 1916, p. 929, and "they may be read as complementary, one to the other, and may in this way serve to bring into greater relief the points in which the experience of home hospitals are in contrast or in accord with those acquired in the Expeditionary Force." In the reprint of a paper on Neurasthenia and Psychasthenia, read before a Conference of Medical Officers at Malta in November last, Colonel Howard H. Tooth essays to define the limits of neurasthenia and the true stigmata of the disease in order that the real neurasthenic may be justly appreciated on the one hand, and that the Army may not be unduly depleted on the other. The Nitrogenous Food Requirements of Some of the Commoner Pathogenic Bacteria is the subject of an article by Lieutenant-Colonel M. H. Gordon, and the joint inquiry by Lieutenant-Colonel C. M. Wenyon and Captain F. W. O'Conner into problems affecting the spread and incidence of protozoal infections of British troops and natives in Egypt, with special reference to the carrier question, is continued.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Lieut. D. R. Kharas, I.M.S.
Capt. M. R. Hughes, Australian A.M.C.

Drowned.

Capt. G. L. Atkinson, R.A.M.C., was a student of King's College, London, and qualified in 1896. He held appointments at King's College Hospital and at the Victoria Hospital for Children, Chelsea, and was in practice at Hampton Hill, Middlesex, prior to joining the R.A.M.C.

Died.

Lieut.-Col M. J. Whitty, R.A.M.C., qualified at the Royal University of Ireland in 1885, and shortly afterwards joined the Army Medical Service, from which he retired in 1906. He was later re-employed as medical officer to the Liverpool recruiting area, and died at Liverpool on March 28th.

Wounded.

Lieut.-Col. W. Egan, R.A.M.C.
Capt. M. A. Nicholson, R.A.M.C.
Capt. A. B. Chapman, Canadian A.M.C.
Capt. A. C. Falkiner, R.A.M.C.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Second Lieut. H. F. Johnson, East Kent Regiment (The Buffs), only surviving child of Dr. G. L. Johnson, of Hampstead, London, and Johannesburg, South Africa.
Lieut. J. S. R. Hodgson, Dorset Regiment, elder and only surviving son of Dr. H. Hodgson, of Alresford, Hants.
Second Lieut. V. F. H. Hugill, Royal Fusiliers, attached Royal Flying Corps, only son of Dr. G. F. Hugill, of Balham, Surrey.

MENTIONED IN DESPATCHES.

The name of the following medical officer should be added to the list of names published in THE LANCET of Feb. 3rd, 1917, p. 201:—

Temp. Capt. E. P. Satchell, R.A.M.C.

THE REVIEW OF MEDICAL EXCEPTIONS.

The Military Service (Review of Exceptions) Bill, which passed the House of Commons on Tuesday last, will give the Army Council the right of requiring disabled and previously rejected men to present themselves for examination. This will throw a prodigious amount of fresh work on medical boards, who will require every possible assistance in the carrying out of a difficult task. The use by the boards of certificates from civil practitioners has been discussed, and it has been felt in some cases that personal bias has been shown leading to the exception of a man who was really fit to serve. It must be remembered, however, that in many instances it is difficult for a medical board to come to a fair conclusion without a reliable clinical history of the man in question, which can only be given by his regular medical attendant. In doubtful cases it would probably be wise to give medical boards power to detain an examinee under observation in a special or military hospital for a short period. Such a course might be found especially useful in conditions such as doubtful cases of pulmonary tuberculosis; slight cardiac weakness when no murmurs are present; difficulty in distinguishing between functional and organic affections; and when malingering (including doping) is suspected. The advantages gained would be similar to those of the observation beds in an infectious hospital or the casualty department of a general hospital—viz., the avoidance of overlooking serious disease not recognisable as such at first sight, and, on the other hand, of attaching undue weight to transient and unimportant symptoms. This course would thus in some instances prove of great advantage to the man and in others to the Army.

OBITUARY OF THE WAR.

MALDWYN LESLIE WILLIAMS, M.B., B.S. MELB.,

LIEUTENANT-COLONEL, AUSTRALIAN ARMY MEDICAL CORPS.

Lieutenant-Colonel M. L. Williams, who died of wounds in France on March 3rd at the age of 31, was one of the best known among the younger men of the medical profession in Victoria. After matriculation he entered Trinity College, Melbourne, and had a distinguished career as a student, graduating with honours M.B., B.S., of Melbourne University in 1908, and obtaining an appointment on the resident staff of the Melbourne Hospital in the following year. He was subsequently medical superintendent to the Bendigo Hospital, relinquishing this appointment to commence private practice in Bendigo. On the outbreak of war he volunteered for active service and was appointed major to an Australian field ambulance which served in Egypt and France. He was later promoted lieutenant-colonel and placed in command of another field ambulance, with which he was on duty when he received the wounds from which he died.

Colonel Williams made many friends during his University career. He gained his football blue and represented Melbourne in Inter-University matches. His loss will be keenly felt by a large circle who regarded him as a man of much promise in the medical profession. He leaves a widow and two children.

SAMUEL W. HEWETSON, M.D. QUEBEC,

LIEUTENANT-COLONEL, CANADIAN ARMY MEDICAL CORPS.

Lieutenant-Colonel S. W. Hewetson, who died at the Royal Free Hospital, London, from perforative colitis, was officer in command of the 8th Canadian Field Ambulance. He was born in November, 1872, at Kincardine, Ontario, entered the medical school of McGill University, where he was a brilliant and popular student, and graduated in 1893. Unfortunately, soon after graduation tuberculosis showed itself, and he became a patient under the late Dr. Trudeau at Saranac, remaining, as did so many of Dr. Trudeau's medical patients, to be one of his enthusiastic assistants at the sanatorium. Readers of his autobiography published last year will recall Trudeau's warm words of appreciation of Dr. Hewetson and his services. His malady led him eventually to settle in the highlands of Alberta, at Pincher Creek, whence, after a few years, when his health was thoroughly re-established, he moved to Calgary, becoming there a popular practitioner. For many years he had been an active member of the Canadian Militia, his majority in the Army Medical Corps dating from 1910. With the beginning of the war he was appointed A.D.M.S. of the Alberta district. Attached first to the 13th Canadian Mounted Rifles in January, 1916, he organised the 8th Canadian Field Ambulance, of which he was placed in command, proceeding overseas to France in the spring of the same year. Lieutenant-Colonel Hewetson was married, his wife having predeceased him.

HERBERT JONES, M.D. ONTARIO,

MAJOR, CANADIAN ARMY MEDICAL CORPS.

Major H. Jones, the news of whose death overseas has been received, was born in September, 1871, taking up his medical studies at a comparatively late period and graduating from Toronto University in 1904. He then settled in practice in Hamilton, Ontario. After the outbreak of war he joined the 5th Canadian Field Ambulance as captain and showed himself an excellent officer, gaining his majority in November, 1915, after several months of work at the front. His death was due to pneumonia, which proved fatal after a brief illness.

HUGH BARR, M.D. GLASG., D.P.H.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain H. Barr, who fell in action in Greece on Feb. 21st at the age of 35 years, was born in Paisley, receiving his early education at the Grammar School there. It was characteristic of him that, even as a student, he had decided definitely on what was to be his life's work in medicine; and it was with the view of acquiring a sound knowledge of

medicine preparatory to embarking on the study of public health that several of the years immediately following graduation were devoted by him to hospital practice in England. Having obtained the diploma of Public Health, he visited Germany, where he studied bacteriology under Professor Dunbar at Hamburg, soon becoming fluent in the language. Going to New Zealand about 1910, largely on account of his health, he quickly built up there a large practice, which he relinquished to accept a commission in the Royal Army Medical Corps. At the end of a year's service in hospital at Salonika he returned to Scotland for a short time, being then sent to Greece. His term of six months, during the latter part of which he was attached to an ambulance train, he had almost completed when he met his end.



A friend who knew Captain Barr intimately speaks of him as one whose cheerfulness and ready wit could not but enliven the dullest company. His mind was always active, and in its interests not confined to medicine alone. His knowledge of sociology and philosophy was considerable, and extensive travelling served further to broaden his outlook. His many friends can ill spare his companionship.

JOHN MAXIMILIAN HAMMOND, M.B., B.S. LOND.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant J. M. Hammond, who died on Feb. 12th of wounds contracted on active service at the age of 41, was son of the late Henry A. Hammond, of Bournemouth. He studied medicine at Bristol University College and St. Bartholomew's Hospital, London, qualifying in 1908 and holding resident appointments at the West London Hospital. In 1911 he started in practice at Bournemouth, becoming medical registrar to the Hahnemann Home, relinquishing this work in the autumn of 1914, when he volunteered to go out to the English section of the French Military Hospital at St. Malo. Last July he was given a commission in the R.A.M.C., sailing for Salonika in August attached to the Devonshire Regiment. He was wounded by a shell during an attack on the Bulgar lines, and did not long survive an operation.

A colleague writes of Lieutenant Hammond as a man who stood over 6 feet high, and of whom largeness was the prevailing characteristic. "Large-hearted, he was always ready to do a kindness to others. Nothing was a trouble, no detail too small to receive attention. At St. Malo, besides treating the wounds of the *poilu*, he ministered to their souls, and with his perfect knowledge of French many was the death-bed soothed by *le grand Anglais*." Fellow officers from the Macedonian front bear testimony to his good influence on the morale of the men. In the end it would seem that he gave his life for them. "I found I had lost my tourniquet," he says, in a letter received since his death, but the missing tourniquet was doubtless doing service to some wounded man whom he had recently tended.



SYDNEY DOMVILLE ROWLAND, M.A. CAMB., M.R.C.S ENG.,

MAJOR, ROYAL ARMY MEDICAL CORPS.

Major S. D. Rowland, who died of cerebro-spinal fever on March 6th, was the son of the Rev. W. J. Rowland and was born in 1872. He was educated at Berkhampsted School and Downing College, Cambridge, where he held a natural science scholarship, finishing his medical studies at St. Bartholomew's Hospital in 1897. Clinical medicine did not appeal to him, and at the end of the following year he joined the staff of the Lister Institute as assistant bacteriologist, remaining attached to that institution until his death. His first investigations dealt with the structure of bacteria and the enzymes in expressed cell juices; then with the late Dr. Allan Macfadyen he was engaged on a long research on the juices obtained by grinding up bacteria at the temperature of liquid air. In 1905 he went to India as a member of the commission for the investigation of plague, and took an important share in making out the relationship of plague bacilli to fleas and in establishing the part played by the rat flea in the dissemination of the disease. On his return to England he worked on problems of plague immunity, publishing a number of valuable papers concerned chiefly with the fundamentals of prophylactic inoculation. On the outbreak of war he joined the R.A.M.C. and went to France in October, 1914, in charge of the first mobile laboratory. Recently he worked at meningococcus carriers, and was thus engaged when he himself succumbed to an attack of cerebro-spinal fever.



Major Rowland's colleagues speak of him as an exceptionally skilled mechanic, whose ingenuity in getting over the technical difficulties of experimental work was of the greatest service to himself and his fellow-workers. His command of microscopical manipulations was also much beyond the ordinary level. "He was interested in almost everything, took the cheeriest zest in life, and was never afraid of his imagination. Impulsive, erratic, generous to a fault, he was deeply loved by his friends."

THOMAS WILLIAM JONES, M.D., D.P.H. LIVERP.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant T. W. Jones, who was killed in action on or about March 10th, at the age of 31 years, had a distinguished career as a student at Liverpool University, winning four of the five scholarships open to him—viz., the Gee Entrance Scholarship, the Junior and Senior Lyon Jones Scholarships, and the University Scholarship in Medicine. He was also Holt medallist and prizeman in midwifery. He graduated M.B., Ch.B., with first-class honours, in 1908, taking his M D. in the following year, and subsequently the diploma of Public Health. For a year he held the Ethel Boyce Fellowship of the University. After holding various resident appointments and the demonstratorship in obstetrics at the University, he was appointed in December, 1912, medical officer of health for the rural district and



borough of Wrexham, and medical officer to the Wrexham education authority. At the outbreak of war he was amongst the first to volunteer for service in the Royal Army Medical Corps, and although his authorities were willing to release him, it was not until November, 1916, that the Local Government Board consented to his accepting a commission. He left for France in December and in February became attached to the Northumberland Fusiliers. He met his death whilst rendering assistance to a wounded man who was unable to take cover from shell-fire.

As a public official Lieutenant Jones enjoyed the confidence of his colleagues. The chairman of his health committee at Wrexham bears witness to his excellent work in progressive sanitation and laments the tragic termination of a career which would have benefited the public health service of the country. Others speak of his duties discharged with thoroughness and efficiency, as well as with a tact which commended him to all his associates. Lieutenant Jones leaves a widow and a little daughter.

CECIL FRANCIS UMNEY.

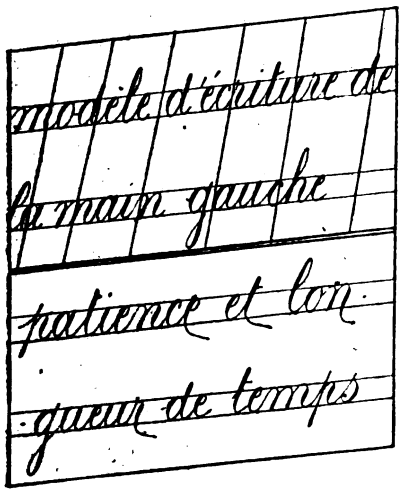
Second-Lieutenant C. F. Umney, Dorset Regiment, who was at first reported missing but is now known to have been killed in action on Sept. 26th last, was elder son of Dr. W. F. Umney, of Sydenham. After matriculating at London University he was apprenticed to Mr. W. H. Martindale, manufacturing chemist, who writes of him as a cheerful and hard worker, showing great promise in his work. "His disposition was one of the brightest, and all with whom he came in contact could not fail to like him."

EDUCATION OF THE LEFT HAND OF DISABLED SAILORS AND SOLDIERS.

Dr. C. W. Hutt writes to us in the hope that the following account may inspire further effort to assist the men in our naval and military hospitals and convalescent homes who have lost their right hand, in acquiring in as short time as possible such a use of their left hand that they may in but small measure feel handicapped by their loss.

At the Ecole Professionnelle de Blessés at Montpellier, since July, 1915, M. Tamenne, a Belgian refugee, has been teaching disabled men how to use their left hands. Having lost his right fore-arm when 16 years old he has so re-educated his left hand that he is almost unconscious of his loss. He needs no assistance to carry out the small operations of daily life; he can shave himself, button collars, tie his tie and bootlaces, cut up meat, peel fruit, roll cigarettes, and get on a bicycle quite as well as a man with two hands. In addition he has learnt and is able to teach writing, shorthand and typewriting with the left hand only. Convalescent men from the military hospitals at Montpellier needing this instruction attend at the school from 2 to 4 daily in the afternoons; some 132 have now passed through the course.

FIGS. 1 AND 2.

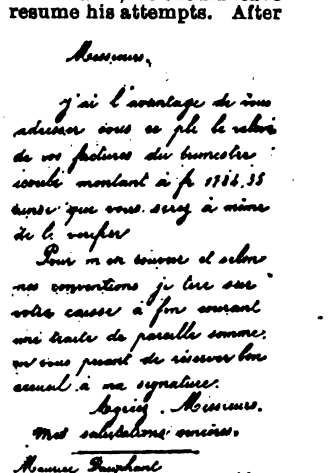


The exact mode of instruction of the left hand in the operations of daily life was recently set forth in THE LANCET,[1] in an abstract of the experiences of Count Zichy, a Hungarian, who, losing his right arm when 14 years of age from the accidental discharge of a sporting gun, taught himself the greatest possible use of his other hand.

M. Tamenne, through the agency of my friend, M. Edmond Dronsart, Directeur Technique de l'Ecole, has kindly sent me a detailed account of his method of teaching handwriting. He places considerable emphasis on the men learning to write in a hand resembling as closely as possible their former handwriting. This, he holds, contributes in a large degree to the men losing the habit of thinking themselves as disabled or handicapped in any way. To this end the writing taught has the same slope as ordinary writing, not even upright writing is allowed. The position of the body is the same as when writing with the right hand; the desired slope is obtained by the position of the fingers and of the paper. To write with the left hand, he says, the man should—

(1) Place his forearm comfortably on the table so as to fatigue the hand as little as possible.
(2) Practise writing between lines about 3·5 millimetres apart.
(3) Place the paper in the sloping position shown in Figs. 1 and 2.
(4) Try from the very beginning to give the usual slope to the letters. If this proves too difficult he should draw faint lines in an oblique direction as shown in Fig. 1, and endeavour to make the up- and down-strokes of the letters come parallel with these lines.
(5) Always take care that the hand is immediately below the point where he is writing.

The man will find the last two rules difficult to carry out and the efforts to do so will tire his hand; he should leave off for a few minutes and then resume his attempts. After about nine or ten lessons of an hour and a half this trouble disappears and the man is able to form the letters easily and well; the movements of the hand become more and more precise. During the next 12 or so lessons he should practise writing between lines about 2·5 millimetres apart, when the letters will be the size used in ordinary writing; later, paper with single lines should be used. A mistake some of the men make after five or six lessons is to try to rush their learning, with the result that they form the letters badly and lose the ground already gained. Speed in writing can only be acquired with practice and time. M. Tamenne finds that if a man practises for more than a limited time each day he loses interest and does not do so well in the end.



Copy of writing of a discharged soldier who has attended the course. His right arm is paralysed.

At first the movements of the hand are uncertain, but care should be taken that the letters are written as much as possible in their usual form, from the moment the man takes up his pen to the end of the last word. It often happens in the formation of the last letter in a word that owing to failure of attention the pen travels below the line. (See Fig. 2.) Patience is necessary from the start; the man must not want to get on too fast; a lesson of an hour and a half is enough for the first ten days. At the end of this time the man may practise for an hour to an hour and a half in the morning and for the same time later in the day, until the time comes when he no longer experiences any fatigue during writing. After two months' tuition the men are able to take their place in the commercial class ("section de comptables") and carry on as well as right-handed men. This work is in a way analogous to the attempt to make children ambidextrous. M. Dronsart has had experience of work on these lines among elementary school children, and has found that the results obtained are not proportionate to the efforts entailed. But one great factor present in disabled men is lacking in these children—necessity.

At Queen Mary's Hospital for Limbless Sailors and Soldiers at Roehampton men are being taught writing with the left hand. Anyone desiring to help our disabled men "se gaucher" could obtain there useful information, or better still, they should try to find a M. Tamenne.

[1] THE LANCET, 1916, ii., 241.

THE NATIONAL RUMANIAN RELIEF FUND.—Sir William H. Dunn, Lord Mayor of London and honorary treasurer of this Fund, has issued an appeal for money to provide Rumania with Red Cross equipment and to relieve distress among the civilian poor. He points out that the medical services of Rumania are quite inadequate to deal with the rush of wounded now pouring in to the already crowded hospitals. The address of the Fund, which is under the patronage of Queen Alexandra and of Queen Marie of Rumania, is 30, Bishopsgate-street, E.C. 2.

THE PARIS CONFERENCE ON THE WAR CRIPPLE.—We have received from M. L. de Paeuw, Secretary-General of the Franco-Belgian Organising Committee, a programme of the important inter-allied conference to be held in Paris on May 8th at the Ministry of Labour. The conference is being called to consider occupational re-education and all the questions which interest the war cripple. Of the five sections, the first is devoted to physical re-education; the second to occupational re-education; the third to the placing of the cripple in agriculture and industry; the fourth to his economic and social interests; and the fifth to the special needs of the blind and the deaf. Contributions to the discussion are solicited from all who have special knowledge, and correspondence is invited with the Secretary-General at 1, rue du Bocage de Bléville, Havre.

CANADIAN ACCOMMODATION FOR CONVALESCENT SOLDIERS.—A Canadian correspondent writes: "The Canadian Military Hospitals Commission announced on Feb. 19th that there is now available in Canada accommodation for 2955 convalescent soldiers. There are established a chain of 29 institutions stretching across Canada from Halifax to Vancouver. Accommodation is also in sight for an additional 2200 as follows: Whitby (Ontario) Hospital for the Insane, 750; Guelph (Ontario) Provincial Prison Institution, 500; Halifax (Nova Scotia) main building, Dalhousie University, 200; Winnipeg old Agricultural College, 600; Saskatoon (Sask.) Y.M.C.A., 160. The actual number of convalescent soldiers under the care of the Commission on Feb. 2nd, 1917, was 1930, besides 105 in other hospitals, and 1021 out-patients. There is also accommodation for 620 cases of tuberculosis in 13 sanatoria, and accommodation for 544 in preparation. The actual number of patients now in sanatoria is 394. A clearing hospital for 550 men has been provided at Halifax, and accommodation for 2225 more is being prepared at Montreal, Kingston, St. John, Halifax, Toronto, and Winnipeg. With a view to future needs accommodation has already been secured for 1589 in 19 hospitals from Quebec to Victoria, B.C. The total accommodation for bed cases will thus be 4364, to which 730 may be added by transferring four of the convalescent institutions to the 'active' class. The total accommodation available or in sight for all classes is 10,683, inclusive of the Quebec clearing depôt, where there is room for 600."

GLASGOW AND MEDICAL MOBILISATION.—At a meeting of the registered medical practitioners of Glasgow and the West of Scotland, held in the Faculty Hall on March 27th, under the auspices of the Royal Faculty of Physicians and Surgeons of Glasgow, questions arising out of the need of the Army for more doctors were discussed. Dr. Ebenezer Duncan, President of the Faculty, was in the chair. Dr. McGregor Robertson's motion "that this meeting is of opinion that the time has come when the whole nation should be mobilised for the successful and rapid conclusion of the war, so that all fit persons shall be liable to be called upon by the Government to render such service in naval, military, and civil departments as they may be deemed suitable for, due regard being paid to age, training, and circumstances," was unanimously adopted, as well as a further motion expressing the opinion (of the meeting) "that to compulsorily mobilise the medical profession in advance of the rest of the community would be unjust alike to the profession and the community at large." A motion proposed by Dr. Charles Robertson, to the effect "that the committee to be appointed by the Government in the event of the mobilisation of the medical profession shall supersede the Scottish Medical Service Emergency Committee, and shall contain a majority of medical practitioners in active general practice," was carried by 45 votes to 42.

GENERAL HOSPITAL, BIRMINGHAM.—The 137th annual report is issued with an appeal for an additional income of £7000 per annum to meet the greatly increased cost of all necessaries. The number of in-patients treated in 1916 was 5562, distributed as follows: civilian 5230, military 332, an increase of 146 over the previous year, the daily average number in the hospital being 341, or an increase of 25 over the average of the past five years. The number of children receiving treatment as in-patients was 1001, of whom 214 were under two years of age. The total income for the year, including special donations and grants from the War Office, was £32,033, as against an expenditure of £38,811, thus leaving a deficit of £6778.

Correspondence.

"Audi alteram partem."

THE CLOSURE OF COLOTOMY OPENINGS.

To the Editor of THE LANCET.

SIR,—My paper on this subject in your issue of March 10th has called forth a number of letters—the best compliment that could be paid to it—which clearly show there is as yet no general agreement among surgeons as to the best method of closing colotomy openings.

Mr. Bernard Roth considers that his method of closing a colotomy, described in his letter of March 17th, is simpler than those I suggested, but it is difficult to see why. I should have thought it was much more complicated, but apart from this, a serious objection to it is that the bowel has to be divided within the abdominal cavity, a practice which all abdominal surgeons, I think, agree in considering bad. Mr. Sinclair White and Mr. Percival Cole both prefer Greig Smith's extraperitoneal method of closing a colotomy opening. I am well acquainted with this method and have used it a number of times in the past, but I thought it was now quite dead or I should have mentioned it in my paper. It appears to me to belong to the same category as lumbar colotomy and to the time when surgeons were afraid of opening the abdominal cavity. What is the objection to opening the abdominal cavity? Mr. Sinclair White himself says, "Every now and then the parietal peritoneum has been punctured, but in no case has this made any difference." Why not then open it deliberately instead of attempting to do the operation extraperitoneally? The extraperitoneal operation is very liable to leave a weak place in the abdominal wall, and many patients have subsequently to wear belts. It also leaves a condition which is not normal and is liable to cause trouble later. While Greig Smith's operation may possibly be quite justifiable in old people, it is certainly unsuitable for young men wounded in the war, who have a strenuous life in front of them; and I cannot see that it has any advantage over straightforward resection and suture.

My object in writing my paper was to describe (1) the easiest, and (2) the best methods of closing a colotomy. There can, I think, be no doubt that the enterotome method is by far the easiest, and it undoubtedly gives excellent results. I have never known peritonitis follow its use, and Mr. Paul, of Liverpool, who used it extensively, has not, I believe, recorded a failure with it.[1] Although it is open to some of the same objections as Greig Smith's operation, it has the advantage that it involves no narrowing at the line of union and no extra-peritoneal bowel. There can surely be no doubt that the best method is that which restores the colon to its normal condition—namely, resection and direct suture. I am surprised to hear that temporary colotomy is a common operation in civilian practice and is performed as a routine in cases of cancer of the colon unaccompanied by obstruction. Why are surgeons so shy of primary resection and suture of the colon that they subject their patients to three operations where one would do? In cases of cancer of the colon accompanied by obstruction there can be no doubt as to the necessity of a temporary colotomy, but this seems an altogether unnecessary procedure in cases unaccompanied by obstruction unless other factors are present which contra-indicate immediate resection and suture.

After having used all the older methods, I now always perform immediate resection with end-to-end suture in suitable cases, and have not had a single failure to date. I see Mr. Finch has doubts as to the safety of getting the patient's bowels open on the second day. Let me assure him that one of the secrets of success with anastomosis of the colon is not keeping the patient constipated. Flatus in the bowel is far more dangerous than a little liquid fæces. The one thing to avoid is the presence in the neighbourhood of the anastomosis of masses of hard fæces and the consequent necessity for drastic purgatives. If the bowels are kept acting daily by small enemata or small doses of salts the risk of leakage is greatly reduced and the colon is kept clean from accumulated and infected blood-clot.

I am, Sir, yours faithfully,

March 31st, 1917. P. LOCKHART-MUMMERY, F.R.C.S.

[1] Brit. Med. Jour., July 27th, 1912

THE LUMLEIAN LECTURES ON HEART DISEASE.

To the Editor of THE LANCET.

SIR,—When a few years ago Sir James Mackenzie, in a public lecture, accused physicians in general, and my teachers in particular, of preaching nonsense I passed the matter by as possibly explicable by his ignorance of what was taught in English schools, but now Dr. G. A. Sutherland repeats the same inaccuracies, I feel bound to protest in the name of fair play and truth, and with your permission would criticise a few of Dr. Sutherland's mistakes.

The function of the heart, as taught to me by Sutton and Clark, was not one only—viz., that of contractility—and they were as well aware as Dr. Sutherland that it had four chambers which under pathological conditions did not work harmoniously. They knew a good deal about its rhythm, excitability, and tonicity as bearing on clinical medicine. I would suggest that their cardiac tonics did reach the heart and so let us hope Dr. Sutherland's do, or his treatment must be very feeble. Valvulitis Dr. Sutherland mixes up in a most casual way with the *effects* of an old endocarditis, but whatever he may mean by it Sutton and Clark never taught that prognosis and treatment were based on the valvular lesion present. If Dr. Sutherland ever evolved from his own inner consciousness the idea that valvulitis is the central factor in heart disease it has naturally misled him, though he may still find infective endocarditis a condition that will demand a good deal of attention.

Where did Sir James Mackenzie (supposing Dr. Sutherland to have got it from him) get the idea that it was taught that back pressure was the *cause* of heart failure? I am sure we were never taught any such foolishness; we were taught, and I still believe it to be true, that failure of the heart causes venous congestion, and this in turn interferes with the function of many organs—stomach, liver, kidneys, &c. The disappearance of the presystolic murmur of mitral stenosis was well known and was ascribed to failure of the left auricle, and I still believe this is true.

Perhaps after the delivery of his lectures Dr. Sutherland may have time to read the late Sir A. Clark's paper on Cases of Bruits without Heart Disease and Dr. Sutton's Lectures on Pathology; they might save him a good deal of trouble and enable him to give more time to what is true and new instead of disseminating an inaccurate representation of what is old.—I am, Sir, yours faithfully,

Harley-street, W., March 21st, 1917. FRED. J. SMITH.

PS.—Of irregularity and its effects or lack of effects clinically Clark and Sutton knew as much as we do now, and tried to teach us.

MACROSCOPIC *VERSUS* MICROSCOPIC AGGLUTINATION TECHNIQUE.

To the Editor of THE LANCET.

SIR,—In a note in THE LANCET of Feb. 17th on the effect of pyrexia on inoculation agglutinins Lieutenant G. Selby Wilson, in carrying out a series of tests by the microscopic and macroscopic methods, finds that the latter gives very much higher readings than the former—that the macroscopic method is, in fact, about 30 times as sensitive as the microscopic.

This marked disparity is, in my opinion, due to the different conditions under which the two series of tests were conducted, and to the very different standard which he takes as the "end-point" by the two methods. The microscopic tests were conducted at room temperature, and the time-limit was half an hour.

In his description of the macroscopic technique he does not give particulars as to temperature and time-limit, but, as the technique was stated to be Dreyer's, we may assume that the tubes were kept in a water bath at 55° C. for two hours. Thus, in three respects, the macroscopic tests were at an enormous advantage over the microscopic tests—viz., (1) longer time-limit; (2) higher temperature; and (3) more intimate admixture of serum and emulsion by the convection currents set up in the agglutination tubes when these are placed in the water bath at 55° C. All these factors, especially the third, facilitate the union of agglutinin with agglutinable substance, and in that way make the method more "sensitive." Another factor in producing the marked disparity between the microscopic and macroscopic techniques in Lieutenant Wilson's results is that his end-point by the former method is practically *complete agglutination* while his end-point by the latter method *is a trace of agglutination*.

If Lieutenant Wilson will conduct a series of comparative tests in which the conditions are more nearly comparable, he will find the results by the two methods more nearly coincide. By removing part of the contents of the last tube which shows macroscopic agglutination for examination under the microscope, he will find agglutination microscopically—otherwise the macroscopic appearance of agglutination in that dilution amounts to an optical delusion. And occasionally the first *negative* dilution macroscopically will, under the microscope, show a *trace of agglutination*.

The advantages of the macroscopic method are so obvious, and so well known to those who have used both, that it seems hardly necessary, when comparing the methods, to do so under circumstances so unfair to the microscopic method.

I am, Sir, yours faithfully,

R. P. GARROW, M.D.,
Egypt, March 12th, 1917. Captain, R.A.M.C.

EXCISION OF THE RETRO-PHARYNGEAL GLAND.

To the Editor of THE LANCET.

SIR,—Mr. Norman Patterson's communication in your issue of last week is of interest in drawing attention to the fact that retro-pharyngeal abscess is in the great majority of cases not due to spinal disease but to disease of the retro-pharyngeal gland. This, however, is now, I think, generally recognised.

I shall be surprised if his method of operation meets with the same measure of agreement. In my own experience no bad results have followed the method of operating through the mouth, and now that, with the aid of the suspension apparatus, this can be carried out with so much ease and comfort, the abscess being opened and the remains of the gland curetted with precision and care so as to avoid material entering the larynx, an external operation seems unnecessary. I am, Sir, yours faithfully,

Glasgow, April 2nd, 1917. W. S. SYME.

Medical News.

UNIVERSITY OF DURHAM: FACULTY OF MEDICINE.—At examinations held recently the following candidates were successful:—

FIRST EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICINE.

Elementary Anatomy and Biology, Chemistry and Physics.—John James Norman Daniels, Norah Hester Hamilton, John Frederick Charles McColl, Mary Foster Richardson, Henry Rochester Smith, Alice Mary Stenhouse, and William Christopher Wardle.

Elementary Anatomy, Chemistry and Physics.—Leo Norton Knight O'Neill.

Elementary Anatomy.—Edith Short Williamson.

THIRD EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICINE.

Materia Medica, Pharmacology and Pharmacy; Public Health; Medical Jurisprudence: Pathology and Elementary Bacteriology.—John Maurice Brydson (second-class honours), Dorothy Edith Butcher, Iris Marjorie Cheeseright, Samuel Foskett, Samuel Elijah Goulstine, John Parkinson Higham, David Levinstein, and Hans Wilhelm Walther.

UNIVERSITY OF MANCHESTER.—At examinations held recently the following candidates were successful:—

THIRD M.B. AND CH.B. EXAMINATION.

F. H. Anderson, Mary G. Cardwell, Harriet R. L. Reid, Brian Walley, and Ethel D. Willis.

SECOND M.B. AND CH.B. EXAMINATION.

R. J. Allison, Mary E. Boullen, E. B. A. Edelston, Olive M. Gimson, Archibald Harris, and Annie G. Thompson.

FIRST M.B AND CH B. EXAMINATION.

Part I., Inorganic Chemistry and Physics.—P. D. Abbatt, G. V. Ashcroft, J. B. Bennett, Clifford Boothman, William Broadhurst, H. M. Coope, Eugenia R. A Cooper, N. S. Craig, S. W. Drinkwater, O. M. Duthie, Winifred M. Edghill, H. E. Emmett, E. S. Frischmann, W. H. Gratrix, Marguerite F. Johnstone, J. I. Kelly, Eva G. Le Messurier, Cecil Nelson, L. S. Potter, W. E. Powell, Margaret Powtall, Ragheb Salib, F. H. Scotson, H. L. Sheehan, Margaret Single, J. W. Smith, Benjamin Sykes, S. N. Taylor, Nora M. Walker, Raymond Williamson, James Worthington, and James Yates.

Part II., Biology.—R. S. van Aalten, P. D. Abbatt, Reginald Anderton, G. V. Ashcroft, J. B. Bennett, Nancy E. Bleakley, James Chronnell, H. M. Coope, Eugenia R. A. Cooper, N. S. Craig, S. W. Drinkwater, O. M. Duthie, Winifred M. Edghill, Caroline M. Edwardes-Evans, Gwendolen A. G. Edwardes-Evans, H. E. Emmett, T. N.

Fisher, E. S. Frischmann, Edward Gleaves, W. H. Gratrix, Ruth Hill, C. D. Hough, Marguerite F. Johnstone, J. I. Kelly, R. R. Lane, W. L. Martland, Eva G. Le Messurier, Cecil Nelson, A. C. Newman, G. F. S. Parker, L. S. Potter, W. E. Powell, Margaret Pownall, W. G. T. K. Robinson, Ragheb Sallib, F. H. Scotson, H. L. Sneehan, Margaret Single, J. W. Smith, Benjamin Sykes, S. N. Taylor, Leo Unsworth, Nora M. Walker, Raymond Williamson, James Worthington, J. R. Wright, and James Yates.

Chemistry.—Nancy E. Bleakley, Caroline M. Edwardes-Evans, T. E. Forshaw, Florence M. I. Graham, C. D. Hough, A. C. Newman, El S. El G. Sheir, Mary I. Turner, and Leo Unsworth.

Physics.—T. N. Fisher.

DIPLOMA IN DENTISTRY (THIRD EXAMINATION).

C. E. Cardwell and Norman Flitcroft.

DIPLOMA IN DENTISTRY (SECOND EXAMINATION).

Dental Mechanics.—E. L. Morgan, Frank Torkington, and Harold Walmsley.

Dental Metallurgy.—Teresa Candon, E. L. Morgan, Frank Torkington and W. R. Williams.

DIPLOMA IN DENTISTRY (FIRST EXAMINATION).

E. S. Poulter.

Chemistry.—Stanley Booth, R. V. Littlewood, and Dorothy Marsden.

No meeting of the British Association, which has assembled regularly since 1831, will be held this year.

A UNIFIED POOR-LAW AUTHORITY FOR LONDON.—The London County Council adopted on Tuesday last a recommendation of its Local Government Committee in favour of setting up at once in London a Central Poor-Law Authority.

SOCIETY FOR THE STUDY OF INEBRIETY.—At the annual meeting to be held in the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., on Tuesday, April 10th, at 4 P.M., Dr. R. Murray Leslie will open a discussion on the Instruction of the Public in the Importance of the Prevention and Arrest of Alcoholism.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Demonstrations of specimens in the Museum will be given in the Theatre of the College, Lincoln's Inn-fields, by Mr. S. G. Shattock, the pathological curator, at 5 P.M. each Monday, as follows:—April 16th, Syphilis; 23rd, Gunshot Injuries; 30th, Gunshot Injuries. The demonstrations are open to medical students and practitioners, as well as to first-aid and ambulance students.

CHADWICK PUBLIC LECTURES.—The spring course of lectures includes two by Captain C. G. Moor, R.A.M.C.(T.), on the Profitable Keeping of Fowls and Rabbits on Hygienic Methods (April 12th and 19th, 6 P.M., at the Royal Sanitary Institute, 90, Buckingham Palace-road, S.W.); a lecture by Dr. F. W. Mott, F.R.S., on Mental Hygiene in Shell-shock during and after the War (April 26th, 5.15 P.M., at the Royal Society of Medicine, 1, Wimpole-street, London, W.); and three lectures on War-Time Food, by Dr. S. J. Moore, medical officer of health of Huddersfield (April 20th and 27th, and May 4th, 7.30 P.M., at the Municipal College, Lansdowne, Bournemouth). Admission to the lectures is free. Particulars from the Secretary of the Chadwick Trust, 40 (6th), Queen Anne's Chambers, London, S.W. 1.

PAYMENT FOR THE DOMICILIARY TREATMENT OF TUBERCULOSIS IN BELFAST.—A Belfast correspondent writes: Under the tuberculosis scheme payments are made to doctors for domiciliary treatment, and in Belfast, at the March meeting of the City Council, a list of payments made to local doctors for this purpose during the past year was presented in the Tuberculosis Committee's minutes for the approval of the Corporation. The total amount was £4,536, divided amongst 101 doctors in amounts varying from £600 to 5*s.*, payments being made according to the number of visits. Among the recipients were several members of the Corporation, and the question now arises of the legality of such payments. It is reported that the difficulty will be got over by some of the medical members resigning their seats, unless the question can be otherwise solved.

THE ROYAL PORTSMOUTH HOSPITAL.—At the annual meeting of the Royal Portsmouth Hospital held on March 27th the report for the past year was presented. It stated that the number of civilian in-patients treated was 2098, of military 598, that the daily average number of beds occupied was 160, and that the average cost per bed occupied was £71 11*s.* 5*d.*, as compared with £65 5*s.* 6*d.* in 1915. The year closed with a debt of £1369. The heightened expenditure of £12,308 was due to the great increase in the cost of provisions, drugs, and other necessaries. Dr. J. T. Leon, an assistant physician for 15 years, whose death had recently occurred, bequeathed £500 to the hospital. The treatment of venereal diseases in the district had been taken in hand, at the invitation of the Portsmouth county borough council, the committee agreeing to coöperate with the council in carrying out the proposals of the Local Government Board on the understanding that no portion of the cost should fall upon the funds of the hospital.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Criminal Law Amendment Bill.

THE Criminal Law Amendment Bill has been passed by a Standing Committee of the House of Commons and been ordered to be reported to the House. One or two interesting matters were discussed in the later stages of the Bill. On Wednesday, March 28th, Mr. DICKINSON proposed to insert a new clause imposing a penalty on a person who, knowing that he was suffering from venereal disease in a communicable form, communicated it to another person otherwise than by sexual intercourse or by gross neglect. The Bill already contained a clause dealing with the communication of disease by sexual intercourse. Sir G. CAVE, the Home Secretary, observed that the proposed new clause as it was framed would render it almost impossible for a person affected by venereal disease to continue to live. The proposal, however, found considerable support amongst members of the Committee, and a division showed that 16 Members were on each side. In the event of a tie the custom is for the chairman to give his casting vote on the side of leaving the matter open for further consideration. Accordingly he voted against the proposed new clause, which was rejected. A clause was brought forward by the Home Secretary to permit of the detention in an approved institution or home of a girl under the age of 18 who was convicted of importuning or solicitation. The detention is to last until she is 19.

National Insurance (Part I. Amendment) Bill.

Sir EDWIN CORNWALL has introduced in the House of Commons a Bill designed "to amend the enactments relating to National Health Insurance with respect to persons suffering from disablement in consequence of the present war." It was read a first time.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 28TH.

Hospital Accommodation at Sandhurst.

Answering Mr. EVELYN CECIL, who asked a question respecting increased hospital accommodation at the Royal Military College, Sandhurst, Mr. MACPHERSON (Under Secretary for War) said: Temporary arrangements have been made to provide extra hospital accommodation in the Commandant's quarters at the Staff College, where 20 beds have been allotted, and during the recent outbreak of mumps certain of the halls of study were utilised. Further hospital improvements are under consideration. There have been two deaths, one from cerebro-spinal fever and the other from pneumonia.

THURSDAY, MARCH 29TH.

Dispensary Medical Men in Ireland.

Mr. DORIS asked the Chief Secretary for Ireland to state under what statute or by what authority the Local Government Board for Ireland claimed the right to object to the appointment of Dr. George Maguire as medical officer of Newport (Mayo) dispensary district, on the grounds that he was of military age; and, if the Board had no such legal right, would he advise the immediate sanction of the appointment, so that the sick poor of this district might have the medical attendance to which they were entitled.—Mr. DUKE replied: Under the Poor Law Relief (Ireland) Act, 1851, the approval of the Local Government Board is required to any appointment of the medical officer of a dispensary district.

Mr. DORIS: Can the right honourable gentleman give me the grounds why this gentleman was not sanctioned?—Mr. DUKE: My impression is that he was not sanctioned because he was of an age when he was eligible to render much more important services to the State.

Convalescent Homes for Nerve-strained Soldiers.

Mr. KING asked the Pensions Minister whether he would specify what arrangements were being made by his department as to the provision of convalescent homes, entirely unconnected with lunacy, for soldiers of the rank and file discharged from the Army owing to uncertifiable nerve-strain where the men had cheerful surroundings and facilities for industrial occupation; and whether any allocation had been made from the National Relief Fund for this purpose under the administration of groups of local committees.—Mr. BARNES wrote in reply: Cases of the kind referred to are being sent by local committees to ordinary convalescent homes which are entirely unconnected with lunacy. A special institution will shortly be opened as an experiment at Golders Green in which men suffering from nerve-shock will be suitably treated and provided with occupation. It is not intended to draw upon the National Relief Fund or this purpose.

Military Service (Review of Exceptions) Bill.

In moving the second reading of the Military Service (Review of Exceptions) Bill, Mr. BONAR LAW (Chancellor of the Exchequer) explained at length the provisions of the measure, which is to permit of the re-examination of men who have been discharged from the Army or rejected at a previous medical examination. He stated the military needs for more men, and said that the Bill would enable the military authorities to deal with a million men, from whom it was hoped to obtain 100,000 recruits. In a long war like this standards had changed and must continually change. Men who were rejected in the earlier stages of the war would now be taken. During part of the Derby recruiting campaign an immense number of men came forward at one time. There were, he believed, on one day as many as 300,000. In these circumstances medical examination was not as thorough as it ought to have been if there had been more time. That was shown on the other side of the picture when many men were taken where it was a distinct disadvantage that they should have been. They were taken on account of being passed improperly by medical boards. If that was so, it might be assumed that some had been rejected who might well have been passed and it was not unfair that they should again be subjected to examination. As to the re-examination of men, he said that the Army Council had had their lesson with regard to medical examination. It was not in their interests either to take men who were not fit for service or to employ the very limited medical staff in constantly examining men who would never be fit for service.

Mr. HOGGE, in submitting an amendment dealing with the pension rights of men who would be brought into military service under the Bill, urged that if men passed the medical examination there should be no question of pre-existing weakness if they afterwards broke down.

Mr. PRINGLE criticised at length medical examinations as they had been conducted.

Mr. ASQUITH said that it was assumed that the men who were going to be re-examined included men who hitherto had been exempted on medical grounds. But some of them might be men who, having been originally passed and gone into the Army, had been discharged as unfit for service. He did not wish to dogmatise, but, so far as he had been able to familiarise himself with the facts, he was not at all sure that an equal number of men had not been passed into the Army who ought to have been. It was a very disputable point as to where the balance lay. No one wished to protect men who had been rejected on imperfect evidence. It was perfectly right that they should be re-examined and perhaps subjected to a fuller examination.

Mr. BONAR LAW said that he would ask the War Office whether it was possible to make the medical examination so perfect as to run no risks of passing unfit men.

Sir RYLAND ADKINS hoped that the services of civilian medical men with their varied experience of many kinds of disease should be utilised to a greater extent in conducting the medical examinations.

Sir MAURICE LEVY asked for an assurance as to the thorough character of the medical examinations.

Mr. MACPHERSON (Under Secretary for War) said that some attacks had been made upon the medical men who had been examining recruits for the last few months. There had been heavy recruiting rushes. He was not surprised that some doctors did make mistakes, but honourable Members would not find a Harley-street specialist looking back upon his medical prognoses and diagnoses who had made less than 1 per cent. of mistakes. He could confidently say that out of 1,500,000 cases the doctors had not made mistakes amounting to more than 1 or 2 per cent. He thought that it was greatly to the credit of the doctors that they had performed the work to such great satisfaction.

The second reading was carried by 175 votes to 18.

In the discussion in Committee on the Military Service (Review of Exceptions) Bill on Friday, March 30th, considerable criticism arose on the provision which permitted men who had been discharged for wounds and sickness incurred at the front to be re-examined.

Sir MAURICE LEVY moved an amendment to the effect that the medical re-examination should be undertaken by a board of not less than two medical men, one of whom should be the man's own doctor if he so desired.

Mr. MACPHERSON pointed out that it would be impracticable to have a rule that the man's own doctor should be on the board who re-examined him. The Government had already stated that the examinations would be made by competent medical boards, including the best available civil medical ability. Two out of every three medical men on the boards would be civilians. A direction might, however, be given by the War Office to the medical boards to receive a certificate from a man's own doctor.

The amendment was withdrawn.

MONDAY, APRIL 2ND.

Hygiene in T.N.T. Factories.

Lord H. CAVENDISH-BENTINCK asked the Minister of Munitions whether his attention had been called to the fact that in some Government T.N.T. factories there were many breaches in the regulations designed to safeguard the health of the workers; was he aware that the exhaust ventilation provided was imperfect and inadequate; that the mess-room, cloak-room, and washing accommodation was also inadequate; and that the distinction between the clean and dirty side of factories had been abandoned so that the garments of those engaged on poisonous and non-poisonous processes mingled together; and would he say what action he proposed to take to improve the conditions.—Dr. ADDISON replied: A set of rules for observance in T.N.T. factories has recently been issued by the Ministry. These embody the practice which has proved most successful in T.N.T. factories, and it is my intention to ensure that the rules as published are complied with in all these factories.

The Calling Up of Medical Students.

Answering Sir W. BYLES, Mr. MACPHERSON (Under Secretary for War) wrote: The arrangements at present in force with regard to all students, including medical students, are that students are not in ordinary circumstances called to the colours if, being under the age of 31 they are classified lower than B 1, or if they are 31 or over and are classified lower than A. Any student falling under this arrangement is, unless in possession of a tribunal exemption, required to join an Officers' Training Corps. In view, however, of the requirements of the R.A.M.C., medical students in any class who are within 24 months of taking their medical degree or licence are not called up if they join an Officers' Training Corps.

TUESDAY, APRIL 3RD.

Military Service (Review of Exceptions) Bill.

In the course of the proceedings in report on this Bill, Mr. PRINGLE moved an amendment to provide that in any case where a man examined under the measure and passed for military service produced a medical certificate that he was unfit for general service, or for any form of military service, he should be entitled to be re-examined by a special Medical Board.

Mr. FORSTER (Financial Secretary to the War Office) resisted the amendment on the ground that the mere fact that the man had been previously rejected would be enough to put Medical Boards on their guard in conducting the examinations.

Many honourable Members urged the Government to accept the substance of the amendment. Sir W. COLLINS thought that there should be an opportunity of consulting specialists in these cases.

Sir J. SIMON said that he was sure that Medical Boards had done their duty to the best of their resources, but they had a very hard task. It was well known that some very serious mistakes had been made, and it was desired that these mistakes should be minimised in the future. It might be said that there might be cases where medical certificates given at short notice without previous knowledge of the case might not be very valuable. But was it not possible that a qualification should be introduced into the amendment to secure that the certificate should only come from a practitioner who wrote with a personal knowledge of the man's medical history? The medical man might also be required to state what in his opinion was the reason why the man should not be called upon to serve.

Mr. FORSTER replied that all honourable Members were at one in trying to secure fair treatment for the men and fair treatment for the Army. He did not want to make any reflections on the medical profession, because taken on the whole it was a singularly honourable profession, but it was generally agreed that some medical certificates were worth a great deal more than others. If it could be secured that all the medical certificates to be submitted to the Medical Boards were of the better character, then he would not hesitate to accept the amendment, but he was afraid that at present he was unable to accept the view that the presentation of a medical certificate by the man who was being examined ought to secure for him an examination by a special Medical Board. He clearly recognised the strong view expressed in the course of the debate, and he would undertake to consult with the Secretary of State for War and his advisers before the Bill was passed, to see how far it was possible to meet the wishes of the House. Further than that he could not go.

The amendment was rejected by 128 votes to 44.

The Bill afterwards received a third reading.

THE death is announced of Emil von Behring, professor of hygiene in the University of Marburg.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

ALL SAINTS' HOSPITAL FOR GENITO-URINARY DISEASES, Vauxhall Bridge-road, S.W.—Clinical Assistant for afternoon work in Out-patient Department.

BLACKPOOL, VICTORIA HOSPITAL.—House Surgeon. Salary £250 per annum, with board, &c.

BODMIN, CORNWALL COUNTY ASYLUM.—Female Junior Assistant Medical Officer. Salary £200 per annum, with board, &c.

BOLTON INFIRMARY AND DISPENSARY.—Senior House Surgeon. Salary £230 per annum, with board, &c.

BOOTLE BOROUGH HOSPITAL.—Junior House Surgeon. Salary £170 per annum, with board, &c.

BRIGHTON, ROYAL SUSSEX COUNTY HOSPITAL.—House Physician and Junior House Surgeon. Salaries at rate of £100 per annum, with board, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Surgeon. Salary £150 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

CUMBERLAND, COUNTY OF.—Female Assistant Medical Officer. Salary £350 per annum.

DERBYSHIRE SANATORIUM FOR TUBERCULOSIS, Walton-lane, near Chesterfield.—Assistant Medical Officer. Salary £300 per annum, with board, &c.

DEVONPORT, ROYAL ALBERT HOSPITAL.—Assistant House Surgeon, unmarried. Salary £150 per annum, with board, &c.

EAST LONDON HOSPITAL FOR CHILDREN, Shadwell, E.—Female Assistant Resident Medical Officer. Salary £125 per annum and all found.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill.—Casualty Officer for Out-patients' Department. One whole time, salary at rate of £150 per annum, with board; or two half-time at rate of £75 per annum each lunch and tea provided.

LEEDS PUBLIC DISPENSARY.—Second Female Resident Medical Officer. Salary £200 per annum, with board, &c.

LIVERPOOL UNIVERSITY, FACULTY OF MEDICINE.—Lectureship in Ophthalmology.

MANCHESTER, ANCOATS HOSPITAL.—House Physician. Salary £150 per annum, with board, &c.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Park-place, Cheetham Hill-road.—House Surgeon. Salary £150 per annum, with board, &c.

MOUNT VERNON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Fitzroy-square, W., and Northwood.—Ophthalmic Surgeon.

NETLEY, BRITISH RED CROSS HOSPITAL.—Two Junior Medical Officers.

NEWCASTLE UPON-TYNE EDUCATION COMMITTEE.—Assistant School Medical Officer. Salary £300 per annum.

NEW HOSPITAL FOR WOMEN, Euston-road, N.W.—Female Assistant Physician and Assistant Surgeon.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician, Casualty House Surgeon, and House Surgeon for six months. Salary £100 per annum, with board, &c.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.—House Surgeon.

ROTHERHAM HOSPITAL.—Junior House Surgeon. Salary £150 per annum, with board, &c.

ROYAL HOSPITAL FOR DISEASES OF THE CHEST, City-road, E.C. 1.—Assistant Medical Officer for Tuberculosis Dispensary. Salary £350 per annum.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SHREWSBURY, SHIRLETT SANATORIUM, Shropshire.—Temporary Assistant Resident Medical Superintendent. Salary £300 per annum.

SOUTH LONDON HOSPITAL FOR WOMEN, 103, South Side, Clapham Common, S.W. 4.—Female House Physician for six months. Salary at rate of £100 per annum, with board, &c.

STOKE-ON-TRENT COUNTY BOROUGH.—Temporary Tuberculosis Officer. Salary £500 per annum.

WEST BROMWICH AND DISTRICT HOSPITAL.—Assistant House Surgeon. Salary £120 per annum, with board, &c.

WHITEHAVEN AND WEST CUMBERLAND INFIRMARY.—Resident House Surgeon. Salary £120 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Brynamman (Carmarthen).

Births, Marriages, and Deaths.

BIRTHS.

JEFFREY.—On March 23rd, at Glenbank, Jedburgh, the wife of John Jeffrey, M.B., F.R.C.S.E.—a son.

MCALLUM.—On March 28th, at Scotswood, Milford-on-Sea, the wife of J. H. McAllum, R.A.M.C.—a son.

MARRIAGES.

FRASER—MELLOR.—On March 27th, at the Parish Church, Ashton-under-Lyne, Thomas Lochhead Fraser, Captain, R.A.M.C., to Dorothy Walton, only child of the late Mr. A. E. Mellor, J.P., of Springfield View, Ashton-under-Lyne.

PEARSE—WILBURN.—On March 30th, at St. Saviour's Church, Colgate, Captain Robin Pearse, F.R.C.S., C.A.M.C., of Toronto, to Amy Christine, eldest daughter of Mr. and Mrs. E. J. Wilburn, The Croft, Southwick.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

MEDICAL NOTES IN HISTORICAL MANUSCRIPTS: THE STUART PAPERS.

PART VI. of the Stuart Papers, belonging to His Majesty the King and preserved at Windsor Castle, has been issued under the auspices of the Historical Manuscripts Commission. These papers were formerly the property of the titular King James III., otherwise the Old Pretender, and his sons, Charles Edward and Henry, the Cardinal Duke of York, and after the latter's death were, with some trouble, acquired by the representatives of the British Crown. The papers now given to the world in six bulky volumes possess, it goes without saying, great historical value. So far as matters of special interest from a medical point of view are concerned, however, there is nothing to be noted beyond descriptions of the illnesses and death of Mary of Modena (Queen of James II.), references to the health of her son, the titular James III., and allusions to their respective medical attendants. As bearing on these points we give the following excerpts from the calendar:—

Court Physicians and Surgeons.

James II. to the Duke of Powis (Lord Chamberlain of the Household).—1695, June 25, St. Germains.—Warrant for swearing and admitting Sir William Waldegrave to be first physician to the King.

James III. to James Porter (Vice-Chamberlain of the Household).—1701, Oct. 24, St. Germains.—Warrant for swearing and admitting the following persons to the following places: John Constable, first physician in ordinary to the King; Calahan Garvan, physician to the Household.

Warrants, dated July 20 and 23, 1706.—For Calahan Garvan and Laurence Wood to be physicians in ordinary to his Majesty (James III.).

Queen Mary to Walter Crane, Gentleman Usher of the Privy Chamber.—1714, Nov. 29, St. Germains.—Warrant for swearing and admitting Michael Bermingham into the place of one of her chirurgeons.

James III. to Joseph Parrelly, Doctor of Medicine.—1761, Aug. 1, Avignon.—Warrant constituting him one of his extraordinary physicians.

Michael Bermingham to James III.—1718, May.—A petition in French stating that he was a native of London and had been for several years a surgeon both at the Hotel Dieu and the General Hospital at Paris and that the late Queen Mother had in 1716 appointed him her sworn surgeon, and praying to be appointed surgeon to his Majesty in reversion after Monsr. Beaulieu without any wages or emoluments.

Health of Mary of Modena.

The Duke of Berwick to James III.—1714, Feb. 4, St. Germains.—"The Queen has had a little shivring this afternoon and her pulse is quick, but Doctor Garvan hopes that a breathing swett will carry it of, so your Majesty need not be in paine about her."

The Same to the Same.—1714, Feb. 15, Versailles.—"This is to give your Majesty an account that this morning at half an hour past eight I left the Queen in a very good way; she had rested in the night; her pulse was pretty well, though not free from feavour, which the doctor does not expect will leave her yet some dayes; in short, we have much more to hope than to feare, and barr accidents we may reckon her almost out of danger."

The Same to the Same.—1714, Feb. 17, 8.30 A.M., St. Germains.—"Doctor Garvan gives an account of the Queen's condition; she is, thank God, in a mending way, though it will come on sloughly. The Physicians finds her pulse almost quite right. She looks much better, and her voice is considerably stronger, so that we have all reason to hope she will doe well.

James III. to Mr. Dicconson.—1714, Feb. 24, Barr.—"My heart is now at ease intirely as to the Queen's health, of which last night's letters brought so comfortable an account. When nothing but strength is wanting, that is soon gained. For God's sake take care she manage herself and do nothing to disorder her, and above all not endeavour to write too soon, for, as great a comfort as 'twould be to me to see her hand again, I had much rather be longer without that satisfaction than that she should in the least incommode herself for it."

The Duke of Berwick to James III.—1714, Feb. 24, St. Germains.—"The Queen, thank God, continues in a thriving way, and I hope within eight dayes she may beginn to sitt up. She sleeps and eats well."

Queen Mary to Mr. Dicconson.—1714, July 5, Chaillot.—"I have bathed this morning, and am very well. I shall know to-morrow by Mr. Garvan the French doctors' advice as to my drinking of waters and which they think best for me."

The Same to the Same.—1714, July 7, Chaillot.—"The French doctors are of opinion I should go to Plombières."

The Duke of Berwick to James III.—1715, April 24, St. Germains.—"Your Majesty will have an account by the doctors of the Queen's sickness. I hope that the quinquina will carry it soon of, but I begine to fear her journey will not be, or at least of a good while."

The Same to the Same.—1715, April 29, St. Germains.—"The Queen, thank God, is free of her feavour, and I make no doubt but with the continuation of her quinquina will not have it any more, but I do not think it possible for her to be soon in a condition of travelling."

The Same to the Same.—1715, May 3, St. Germains.—"The Queen is much better, but still very weak."

Queen Mary to Mr. Dicconson.—1715, May 26, Chaillot.—"I thank God I have no other ailement than the gout. I had a great deal of peine last night, but, after I was a bed, I grew better and I slept

well. I am pretthy well to-day, but not able to sett my foot to the ground."

The Same to the Same.—1715, May 27, Chaillot.—"Tho' the peine in my foot is very muech abated, yett it is very red, and very much swelled, so that I don't think I can putt it to the ground, nor will I trye if I can, till to-morrow; but I think it necessary Dr. Garvan and Beaulieu should see it to-morow or Wednsday. Therefor pray gett them a Bureau chair to com hether one of these two days that I may resolve with theyr adice what to do."

General George Hamilton to the Duke of Mar.—1716, Feb. 13, Paris.—"The Queen has not been very well with some touches of the gout."

L. Inese to the Duke of Mar.—1717, Sunday, Sept. 5.—"Queen Mary hath been much out of order of late by colics and a looseness that hath mightily weakened her. She is now much better."

Queen Mary to Mr. Diccon·on.—1717, Sept. 19, Chaillot.—"I was farr from well all day yes·erday, but I have had a good night by the help of treacle and ladon·om drops, and am well enough to-day."

L. Inese to the Duke of Mar.—1717, Monday, Dec. 20.—"Queen Mary herself has been and still is indisposed, though without any danger. She had a great pain in her hand before it swelled, but now she is much more easy. Her physician is not sorry that her ailments are turned to the gout."

(To be continued.)

THE ROYAL SOCIETY OF MEDICINE AND THE JOURNALS OF MILITARY HOSPITALS.

To the Editor of THE LANCET.

SIR,—A number of military hospitals, both here and at the front, are printing "Gazettes," and many of them contain matter which cannot fail to be of interest to the future historian of the medical aspects of the war; and it is, therefore, important that some complete sets of each should be preserved. I presume that those responsible for their issue deposit the usual copyright copies at the British Museum and the other copyright libraries, but my object in writing is to urge that they should also send complete sets (preferably two sets) to the library of this Society, the largest medical library in the Empire. I would undertake that they would be carefully bound and preserved and would always be available for reference.

I am, Sir, yours faithfully,
J. Y. W. MACALISTER, Secretary.

1, Wimpole-street, W., March 30th, 1917.

UNTAPPED SOURCES OF STARCH.

To the Editor of THE LANCET.

SIR,—In an interesting book published in 1854 under the title of "Wanderings among the Wild Flowers: How to See and How to Gather Them," containing two chapters on the economical and medicinal uses of our native plants, by Spencer Thomson, M.D., F.R.C.S.E., reference is made to the *Arum maculatum* as a source of starch. "The tuber of the arum in its natural state," says the author, "contains an acrid juice along with a considerable amount of starchy flour; the latter when freed from the acridity constitutes a nutritious article of diet"; and in the chapter dealing with the economic properties of British wild plants he adds: "the root-tubers of the arum or cuckoo-pint are collected and prepared for sale." In view of the great need for home-grown starch at the present time it would be interesting to know whether the arum could be cultivated with any prospect of adding to our supply. In Elizabethan times arum starch was used to stiffen ruffles, and it might still serve the purpose of starching linen instead of wasting upon mere vanity any of our present scanty stock of starch.

I am, Sir, yours faithfully,
March 30th, 1917. CERES.

"LA BAIONNETTE."

LONG years ago it was said that the true test of wit was whether it could be translated into a foreign language and lose no point thereby. A mere pun will not bear this test. The following, extracted from the number of *La Baïonnette* of March 1st, will, perhaps, pass the test:—

La Paperasse.

Quelqu'un l'a dit: pour tuer un homme il faut dépenser son poids de plomb.

Mon ami, je puis vous assurer que, pour le guérir, il faut au moins trois fois son poids de papier!

The sketch shows an officer with his right arm in a sling interviewing an army official seated at a table with enormous piles of papers stacked up at either hand and a few loose sheets flying around the room. It is true that we have all heard that it takes a man's weight in lead to kill him, but we have not all yet heard that it takes three times his weight of paper to cure him—and paper is so dear now. This highly coloured and amusing paper looks with a comic but sympathetic eye on the medical and Red Cross work in the war and its responsible editors are M. Gus Bofa and Jean Villemot, who are careful to state that the sketches are purely imaginative and that no ill-will must be suspected towards any medical or auxiliary staff. The number costs 25 centimes and is published on Thursdays at 30 rue de Provence, Paris.

GUM AS A FOOD.

THE question of how far gum is utilisable as food in the same way as starch and sugar is probably not yet finally settled. It seems to have exercised the minds of pharmacists and medical men for a long time, some affirming that orientals could live on gum alone and others denying or doubting it, supporting their denials by reference to experiments performed by well-known observers or by themselves. Pavy said that "gum is, doubtless, susceptible of being utilised as an alimentary principle, although nothing definite is known about what becomes of it when introduced into the alimentary canal." He adds: "I have experimented both upon rabbits and dogs with reference to this point." Magendie also fed dogs on gum, but they apparently soon died from inanition. The varieties of gum, however, are many, and their properties undoubtedly vary owing to the mixtures of different gums by natives and dealers. In 1847 Mr. John Savory, the President of the Royal Pharmaceutical Society of Great Britain, wrote as follows of gum arabic:—

Among the demulcent substances, gum Arabic is the most frequently used in the practice of medicine. It is sometimes given alone to relieve tickling coughs, by allowing it to dissolve slowly in the mouth. A solution of this gum, in the proportion of one ounce to a pint of barley water, taken to the extent of a wineglassful, furnishes an excellent beverage in cases of inflammation of the kidneys and bladder and in the inflammatory stage of gonorrhœa. From its light and supposed digestible nature, it is considered a wholesome and nutritious food, thousands of the Moors supporting themselves entirely upon it during the time of harvest. Hasselquist mentions in his Voyages that a large caravan of Abyssinians would have starved if they had not discovered a stock of gum Arabic amongst their merchandise, on which alone a thousand persons subsisted for two months. About six ounces of this gum are sufficient to support a man for a day: it is mixed occasionally with milk, animal broths, and other victuals.

Gum arabic is said to consist of 70 per cent. of arabin, isomeric with cane sugar, 17 per cent. of water, and potash and lime. Arabinose, or arabin sugar, is a crystallisable sugar or glucose, and is prepared by the action of sulphuric acid on arabin. Fredrik Hasselquist was a Swedish naturalist, and one of the most eminent pupils of Linnæus. Having heard Linnæus express a wish that some naturalist would explore Palestine, he embarked in 1749 and explored Egypt, Arabia, and Palestine, and was about to return with a rich collection when he died at Smyrna in 1752. His valuable observations were published by Linnæus in Swedish, and translated into English in 1766, under the title, "Voyages and Travels in the Levant, 1749–52."

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, April 3rd, 1917.

Date.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Tem.	Wet Bulb.	Dry Bulb.	Remarks.
Mar. 28	0·05	62	45	30	34	36	Overcast
" 29	....	79	50	36	41	44	Cloudy
" 30	0·05	87	51	36	38	39	Cloudy
" 31	0·25	49	39	34	36	36	Overcast
April 1	0·19	64	41	32	33	35	Overcast
" 2	0·05	71	40	31	34	34	Snowing
" 3	0·12	79	44	33	34	35	Cloudy

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

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The Lettsomian Lectures
ON
WAR SURGERY OF THE ABDOMEN.

Delivered before the Medical Society of London

BY CUTHBERT WALLACE, B.S. LOND., F.R.C.S. ENG., C.M.G.,
SURGEON TO ST. THOMAS'S HOSPITAL; CONSULTING SURGEON, BRITISH EXPEDITIONARY FORCE.

LECTURE I.

Delivered on March 19th, 1917.

FOREWORD.

MR. PRESIDENT AND GENTLEMEN,—I have entitled these lectures "War Surgery of the Abdomen," but it may be asked if there is really such a thing as war surgery as distinct from civil surgery. I am inclined to think that there is very little difference. What actual difference there is lies in the anatomical nature of the injuries, such injuries perhaps being influenced in some degree by the high speed of the projectile, though this has, it seems to me, been very much over-emphasised.

Good surgical principles apply as much in war as in peace and should govern all our treatment if we wish for good results. War surgery is really largely concerned with overcoming what, in civil life, one would call "adverse circumstances," and in striving to make war conditions as much like peace conditions as is possible. It is in great degree a matter of when and where to operate and how best to move the wounded man to the place where he will win back to health.

There has been, and I daresay there always will be, some difference of opinion between the medical and military branches. The surgeon wants to start treatment as soon as possible and to keep his patient quiet; the soldier is mostly concerned, and rightly, to clear the fighting area of the sick and wounded. There are some surgeons who are too surgical and some combatants who are too combatant. The result, of course, is a compromise. A happy sign is the passing away of the old shibboleth, "You cannot do this—we are at war." I should say in no previous war has the medical man had it so much his own way. There is a sympathy and trust between the combatant and the medical branches which was not present in South Africa. The old-style staff officer, who cursed the ambulances at one time for being in the way—and soon after for being out of the way—is defunct.

The Medical Service in its present campaign is without exaggeration a wonderful organisation. It shows signs of strong life, for it continues to improve. So good is it that we must continue to strive in every way to make it better and better; we must use every means to improve mobility and to save labour, and adapt ourselves to the ever-changing conditions of war.

UTILITY OF FORMER EXPERIENCE.

Of this I am somewhat doubtful. It is in some ways as much a hindrance as a help. In judging of the number of the wounded; the proportion of killed to wounded; the accommodation required, it seems to have been a help as such things alter but little, though they are altering; but as a general guide to surgery it has been, if anything, somewhat of a handicap.

In South Africa one learnt to treat many wounds with little respect. One allowed wounds received under non-surgical conditions to scab over, and many became confirmed in their opinion that rest, starvation, and morphia was the right treatment in abdominal wounds.

This war has proved that good surgical principles will assert themselves—that the dirty wound must be laid open and that a penetrating abdominal wound must be explored.

The changing conditions of wars seem to show that surgical histories brought out after the war are largely a labour lost and a waste of time. Every effort must be made to summarise and render accessible the experiences of the early months of a war for use in its later periods. This has been done in the present campaign by both combatant and medical services. The Army is full of schools where by lectures and demonstrations officers and men are taught new methods of warfare. Although from the nature of things the same methods are not applicable in the Medical Services, a great deal has been done to spread knowledge.

The Army Medical Department has issued pamphlets on various subjects wherein the experience gained has been put at the disposal of all the officers attached to the Army. There is also the Medical Research Committee, whose arrangements for the interchange of knowledge by post-cards, and reports which tell of the progress of cases as they pass from one unit to another, have been of the utmost value. I should like to take this opportunity of asking those into whose hands such inquiries come to use their utmost power to supply the details asked for. By such means treatment has been modified and improved with the knowledge gained.

A series of well-observed cases while the war is in progress is worth pages of statistics when the fight is over. At the beginning of the war there was somewhat of a breach between the front and base in France and the base in England. Now there is no such breach and the experience gained at the base is transmitted to the front and surgical procedure varied in accordance with the results.

Sympathy between the different units through which a wounded man passes is essential. There has always been a tendency to criticise the unit in front of you; but it is always well, if you feel critical about the condition of a patient whom you received from a unit nearer the firing line, to try to put yourself in the position of the medical officer from whom you received the patient. It has often happened to me when treatment has seemed open to criticism, to find that all has been explained by a personal visit to the medical officer, or unit from which the case has been received. The passing of a wounded man from one unit to another is unavoidable in war, but every attempt must be made to lessen the disadvantages by the interchange of knowledge and the cultivation of friendly, not captious, criticism.

There is another way in which knowledge has been diffused. I refer to those medical societies which have been instituted in various areas. These are, of course, largely concerned with local interests, but the work they have done has been extraordinarily good. There is a society at one of the bases which has been of more than usual value, as in it medical officers, through whose hands the patient passes in his journey from the trenches to the base, have met, and such meetings have been very useful in making clear to the medical officers the difficulties that are met with in the various evacuation hospitals. I am quite sure that these meetings have tended to make men more sympathetic to those who are working under different conditions.

Again, I believe that one of the most useful functions of a consulting surgeon has been the carrying of facts or opinions not only from the front to the base, but from one unit to another.

THE FASCINATION OF ABDOMINAL SURGERY.

That it is a fascinating subject there can be no doubt. It is still more or less an unknown region in surgery. It is a comparatively new subject and has risen from nothing to its present position during the lifetime of most of those present. Even in civil practice there are many problems still to be solved, and naturally there must still be many more in surgery of the abdomen in war. Its interest lies, perhaps, in the need for rapid decision, rapid action, and in a supposed dexterity which is not required in other branches. It is the Mecca of all young surgeons—and, for the matter of that, of many old ones. There is more joy, possibly, over one abdominal wound which recovers than over twenty other more ordinary cases.

It is a curious fact that interest in abdominal surgery is shared by the public, as anybody may ascertain who has followed the discussion on the treatment of abdominal wounds in this war. If the abdomen is an unknown ground to the profession, it is still more so to the ordinary public—hence the interest of the layman.

SURGICAL OPINION WHEN THE WAR STARTED.

There is no doubt that for many years it has been held that the operative treatment of abdominal wounds was not to be advised under war conditions. This was partly due to

want of success, as in the Spanish-American War, and partly to the fact that many military surgeons were opposed to extensive operating anywhere near the firing line, and as abdominal surgery, to be successful, must be done at once, it is obvious that it could not be undertaken with success where all operations had to be postponed to a late period. Although the expectant treatment was the orthodox one when the South African War broke out, many civil surgeons hoped to prove that it was wrong. Surgeon-General W. F. Stevenson even issued an appeal for the trial of operation. The result was, however, only to confirm former opinion, though this opinion was now held on two somewhat different grounds. One school held that the expectant treatment was in itself the right procedure, the other that it was the best that could be done in war.

Some people believed that wounded intestine healed sufficiently often to warrant abstention, others, headed by Makins, believed that small-gut lesions were practically always fatal, and that the success obtained by the "wait and see" policy was due to the escape of the bowel, although the belly had been penetrated. Makins's opinion that the small-gut area could be traversed by the small bullet without injury has been proved in this war. If one reads the literature of the South African War, both private and official, the reason for want of success is at once obvious—the cases arrived too late. It was not so much a question of the success of the expectant treatment as a failure of the operative. Operations were secondary or late, and two strikingly successful cases of resection of small gut (Messrs. Neale and Tuke) were operated on within 6 and 12 hours respectively.

The reason for the late operation was the nature of fighting in an unsettled country of great distances. The wounded could not be quickly brought to a hospital equipped with the necessary appliances. To operate in the veld with what appliances were at hand was too disheartening. It was impossible to get even moderately decent conditions. There was little or no water, and what there was was often too filthy for words—the water of dams. In addition there was the plague of flies that settled on everything, and, lastly, the operated man could not be kept quiet; it was lucky if he could ride in a horse ambulance.

The conditions were utterly different from what now pertain, and this is the first time since the rise of abdominal surgery that a great campaign has been fought in a settled country and, what is more important still, with a fixed fighting line.

The small number of figures dealt with in the South African campaign was also a source of error. In order to form an adequate idea of the efficacy of any treatment it is necessary to strike an average over a large series of cases. Now, in this present war one of the difficulties of establishing the operative treatment were the runs of bad luck which any operator had to face. Even now, with conditions as nearly ideal as possible, one may meet a series of nine consecutive fatal cases. This must have a very depressing effect on any young surgeon or one who is not convinced that the operative treatment is in the main the best of all. Now, nine abdominal cases means roughly about 600 wounded men, taking a moderate estimate of the proportion of abdominal wounds to total wounds. As a matter of fact, in the South African campaign a casualty list of 600 wounded was considered a large one. It can therefore be seen that if an operator happened to encounter such a series it is not to be surprised at that he had doubts as to the correctness of his procedure.

The statistics of the South African campaign are very defective. Surgeon-General Stevenson, in the official history of the war, was only able to collect 207 cases of abdominal wounds. Among them it is stated that there were 26 laparotomies with 18 deaths, a mortality of 69·2 per cent., and according to Stevenson the mortality was really even worse. The total death-rate of all abdominal wounds quoted, operated and unoperated, is given as 30·4 per cent.

In his most recent work, 1910, "Wounds in War," the mortality is shown as 51·6 for laparotomies, the total of cases remaining the same—namely, 207. In any case the figures are really too small to have any real value. Figures show that in the present campaign a mortality of 50 per cent. is a good result, but such a mortality in civil practice would be considered an awful death-rate to face. And yet it means, looking on the bright side, many lives saved.

There is no doubt that certain people shot through the abdomen in South Africa, and treated expectantly, recovered. As a matter of fact, there were two officers well known in the R.A.M.C. who recovered after such treatment, and I have no doubt that a knowledge of their recovery greatly strengthened the opinion that expectant treatment was, on the whole, the best. There is no doubt that such successful cases make a very great impression on one.

The South African campaign may then be said to have left surgical opinion opposed to operation. This opinion seems to have been only strengthened by succeeding wars—the French War in Morocco, the Balkan War, and the Russo-Japanese War. In the last war the results were so bad that the Japanese forbade operation in the ambulances; even in the fixed fighting round Port Arthur little measure of success was obtained. On the Russian side, it is interesting to note that a Princess Gedroitz, in an operating wagon, met with some measure of success, and fixed the limit of successful intervention to three hours after the receipt of the wound. It is stated, at all events, that she saved the life of a colonel shot in the small intestine.

METHOD OF TREATMENT IN THE EARLIER PERIOD OF THE WAR.

It is not intended here to say anything about the period of the retreat. Under such conditions adequate provision for operating near the front was an impossibility, and all that could be done was to get rid of the wounded to the base with the least possible discomfort to them. When the line became fixed the conditions were very different and there was a possibility of operating under good conditions. It was no longer a question of whether a man could be operated upon, but whether he should be operated upon. Still, however, the old belief in the efficacy of the expectant treatment obtained.

In order to understand what was done during this period it is necessary to say a word or two about the standard system by which the wounded man was evacuated. Shortly, it was as follows: A wounded man was first seen by the regimental medical officer to whom he was brought in the regimental aid-post situated somewhere in the trench system. He was then transferred by a stretcher to an advanced dressing station, usually situated just behind the trenches, and from there by car to the field ambulance and there he was kept until the time the motor convoy arrived—usually once in the 24 hours. By this he was taken to the casualty clearing station, which was the first place adequately equipped for operative treatment. In the early days the clearing station was a very different hospital from what it is now. But, still, there was reasonable facility for the performance of any operation if it was thought advisable. With the idea of avoiding the disturbance of movement, a man wounded in the abdomen was kept sometimes, though not usually, in the regimental aid-post; often he was kept at a field ambulance, but usually he was transferred to the casualty clearing station and there treated.

The usual mode of procedure was to put the man in the Fowler position, to improve the general condition by rest and warmth, to withhold food and water for three days and to administer morphia. The thirst which was a distressing symptom of this treatment was combated to a certain degree by rectal salines and mouth-washes.

I should like here to pay tribute to the great care and attention which the medical officers lavished on the cases Certain officers were told off day and night to attend to these patients, and everything that could be done to alleviate their suffering and to make them as comfortable as possible and to cheer them up was done. I should say that if anything could have got these men well the attention that they received would have done so. The people who conducted the treatment were firmly convinced of its efficacy.

This belief was strengthened by the behaviour of the patient. Many patients, at first gravely ill, went through a period of improvement which often was very striking. It was in a way unfortunate; but there is no doubt that improvement did take place, and so well were many of them that they were evacuated to the base and arrived there sometimes in good condition and sometimes gravely ill. The men who saw the cases leave them apparently on the way to recovery could not bring themselves to believe that such cases did badly at the base. It was unfortunate, no doubt, that the means of communication between the base and the

front was, in those days, inadequate, and this serves to emphasise what I have already stated about the value of free interchange of reports between the front and the base.

If evacuation of these cases had not been necessary and it had been possible to keep them at the clearing stations, I have no doubt that the expectant treatment would not have survived as long as it did, for medical officers would have seen such cases become worse and worse, and in the end die. As a matter of fact, during my six months' experience at the Red Cross Hospital at Netley, I only saw two cases of wounds of the abdominal viscera; one was a case of cæcostomy and the other a transverse colostomy.

When I arrived in France in May, 1915, I spent some time at the base before I was sent to the casualty clearing stations. I had the advantage of learning what was Sir George Makins's experience in the unoperated abdominal cases and heard that many died who had been thought well enough to be sent to the base. I had always believed that operative treatment, provided adequate arrangements could be made, was the ideal thing. What I saw at the base and front only confirmed me in my belief that the best hope for the patient lay in an operation. I had no doubt that many cases which were put down as penetrating abdominal ones had not suffered injury to any hollow viscus, and many that were considered penetrating were really only wounds of the abdominal wall. I certainly saw many people treated by the expectant treatment die even at the casualty clearing stations, some after the period of delusive improvement.

The expectant treatment was also a very trying time for the wounded man. The knowledge that nothing could be done for him by operation, and that the only thing was to wait events, had a very depressing effect, although the medical officers did everything to cheer them up. The idea was getting about that the doctors were unable to help a man who was wounded in the abdomen, and that he had really little chance.

It is curious, but true, I think, that the wounded soldier welcomes operation. He feels that something is being done for him. I have often been asked the question, "Can't you operate?" If I have answered in the negative, with an assurance that operation is unnecessary and that he will do well, I have often detected a look of disappointment on the patient's face. I mention this as showing that operation has no horrors for the soldier.

Experiences of the Allies.

The French have gone through very much the same experience in the treatment of abdominal wounds. At first the only operation officially blessed was that of the suprapubic drainage of Murphy. Gradually they have, like ourselves, abandoned the expectant for the operative treatment.

I cannot do better than quote you a letter which Professor Tuffier has kindly written me. He says:—

Abdominal surgery has undergone in France the following revolution. Until the month of February, 1915, installations did not allow one to operate, under good conditions, on wounds of the abdominal cavity, and abstention was necessary in these circumstances. At this period I found in a small ambulance quite near the front, and very well organised, several cases of cure of wounds of the intestine by laparotomy. I reported them to the Society of Surgery and a movement commenced in favour of operation for all abdominal wounds. It is because the motor surgical ambulances and the medical arrangements have been better organised, and because the evacuation of the wounded has been done in a relatively short time, that we have been able to arrive at a certain measure of success.

With the French, as with us, the period of the retreat corresponded to the period of expectant treatment, and when the line became fixed the treatment underwent the same change as it did in the British Army. As a matter of fact, after the establishment of the operative treatment some French surgeons have from time to time again championed the expectant treatment, but this finds little acceptance with the majority of French surgeons.

Mortality in the Pre-operative Days.

One is surrounded by all sorts of difficulties in trying to reckon the mortality, and all the figures that can be obtained must be considered only approximate. One of the chief difficulties is the determination as to whether a wound is really penetrating. Those who favour the expectant treatment would naturally tend to include cases which those who are opposed to this treatment would exclude.

Into nine field ambulances over a period of six months there were admitted 1098 abdominal wounds with 333 deaths—a mortality of 30 per cent. In the six casualty clearing stations during the same period there were admitted 131 cases of perforating abdominal wounds with 73 deaths. From these figures it appears that the total mortality in the field ambulances and clearing stations was about 70 per cent. This, of course, does not include the deaths before patients reached the unit where statistics are kept.

There were also the deaths at the base in France to be added, and in the pre-operative days to which we now allude many such deaths occurred, which would, as far as can be judged, bring the mortality up to about 80 per cent.

As showing the difficulty of arriving at accurate figures, it may be stated that statistics were prepared by certain people which stated that 80 per cent. of abdominal wounds recovered. These statistics, as a matter of fact, were got from certain ambulances and casualty clearing stations in which the surgeons were enthusiastic supporters of the expectant treatment. It is significant that in these units the proportion of abdominal wounds to total wounds was high.

In talking over the possibility of improvement with Colonel Crisp English, with whom I was fortunately associated when trying the effect of operative treatment, I used to say that if one could bring about a reduction of the mortality by 10 per cent. one would be fortunate. There was no question of revolutionising the mortality, because with the abdominal wounds there would be a very heavy mortality, and it was only a question of saving a certain number of lives which otherwise would have been lost by the expectant treatment.

Commencement of the Operative Treatment.

Although rest treatment was the rule, some attempts at operation had been tried. Early in the war Souttar commenced early operation with the Belgian Army, and credit must be given to him for what he did. Owen Richards was the first, I believe, to publish results of operative treatment in the British Army.[1] The first case of operation was performed on Jan. 28th, 1915, and the first successful case, that of a resection of 2½ feet of the small intestine, was performed on March 18th, 1915, 36 hours after receipt of the injury, which period still stands as a record as regards time elapsed since the wound. A few other English surgeons had tried what could be done by operation, but the results were undeniably bad—so bad that most people had abandoned the attempt. The reason for this was, no doubt, the late arrival of the cases at a place where an operation could be performed.

Holding the opinion that operation was right, I commenced operating and making post-mortem examinations and soon convinced myself that the injuries were, as a rule, of such a nature that recovery must be a very rare event. It was also found that hæmorrhage was a chief cause of early death and that bullets produced very extensive injuries. It has always been granted that hæmorrhage was the chief cause of early death, but the advocates of expectant treatment seem to have focussed their attention more on the danger of peritoneal infection and the possibility of its localisation or disappearance than on the possibility of spontaneous arrest of hæmorrhage.

The discovery that bullets produced extensive gut injuries was also of great importance, as much stress had been laid on the smallness of the lesions produced by the modern small-bore bullet; in fact, the hope of spontaneous recovery of gut lesions was based on the assumption that such projectiles were comparatively innocuous. This idea was constantly put forward in the early period of the war.

The re-establishment that hæmorrhage was the chief cause of early death was of great importance, as it showed that only by rapid evacuation could one hope to combat such a condition. In June, 1915, I talked the matter over with Surgeon-General W. G. Macpherson, and obtained his leave to get some of the field ambulances to send the abdominal wounds at once with all possible celerity to the nearest casualty clearing station. The results obtained by this small experiment were encouraging, and in the first week in August, 1915, Surgeon-General Macpherson gave the order which made the rapid evacuation of abdominal wounds the official method in the First Army. This was followed by rapid improvement in the results obtained.

[1] Brit. Med. Jour., August 7th, 1915.

SELECTION OF CASES FOR RAPID EVACUATION.

The order to transfer all abdominal cases with celerity to the casualty clearing station put a great deal of responsibility on the field ambulance officers. It is no light task to decide what cases can stand evacuation; in fact, it is one of the most difficult things that a medical officer is called upon to determine. Many cases, of course, are better of a rest and food and warmth, but in the case of abdominal wounds it must be remembered that hæmorrhage is a chief cause of death, and that the only hope for their salvation lies in the arrest of the hæmorrhage by surgical means. It is, therefore, obvious that it is worth while taking risks in cases of abdominal wounds which it would not be right to take in other cases. It is quite true that there is an appreciable danger of death from peritoneal affection, but, as a matter of fact, experience has shown that the need for celerity on this account is nothing compared to that necessary in the cases of hæmorrhage.

COLLECTION AND EVACUATION OF WOUNDED.

In forming a judgment on the results obtained by the operative treatment of abdominal injuries it is necessary to know something about the means by which such cases reach a casualty clearing station. A knowledge of the difficulties is also necessary in order to form an appreciation of the really magnificent work which is being done by the regimental medical officer and his stretcher bearers and by the personnel of the field ambulances. One can consider this subject under two heads: (1) the collection; (2) the evacuation of the wounded man.

1. By *collection* is meant the finding and bringing back to the regimental aid post the wounded when they lie out in front of our lines; and without going into particulars it can be well understood what the difficulties are when an attack has been made and our troops have advanced. If it is difficult to find and collect the wounded after a successful attack, it it still more difficult when the fortunes of battle sway backwards and forwards; and it is under the latter conditions that the wounded lie out for a considerable period. In quiet times the collection is not difficult, for the men are wounded very often in the trenches themselves.

2. *The evacuation.*—We will consider that a man has been wounded in the front trench. The first field dressing most probably will be applied by himself or by one of his companions; possibly by the medical officer himself. The patient will then walk, be carried, or be taken on some kind of stretcher to the regimental aid post. Even this is performed under considerable difficulties because the nature of the trench system involves getting round many sharp angles. The regimental aid post is situated somewhere near the front line or in the commencement of a down communication trench. It is generally in a dug-out, or cellar; the accommodation is not grand, but one cannot help admiring the ingenuity with which these places are arranged and the care taken to make the surroundings as perfect as possible. The neatness of such places is really greatly to be wondered at, fitted up as they are with extemporised shelves and tables and trestles for the stretchers. Here the wounded man will be attended to if the regimental medical officer has not already been seen by him. An adequate dressing will be applied and the ordinary medical measures taken for his comfort.

Under the present system of evacuation an abdominally wounded man will not wait in this place. He will be taken on a stretcher down the communication trench to a field-ambulance post, which is a dug-out where the field ambulance personnel are accommodated and where the regimental stretcher-bearers hand the case over to the field ambulance. From this point commences the long journey—sometimes as much as two miles—down the communication trench. Everyone has seen pictures of such a thing, but to appreciate the physical strain on the bearers the journey has to be made by oneself. Sometimes the journey is so arduous that one complete tour is all that a stretcher party can manage without a long spell of rest. In summer time the air is often stifling. Under foot are the duck boards or a rough brick pavement. The provision of these renders walking more easy, but the surface is necessarily uneven, especially where one board joins another. Sometimes a rung is out, and at other times the board is apt to tilt and get up and look you in the face. Then there are the innumerable corners formed by the zigzag of the trench and made to stop the enfilade fire and limit the danger of an exploding shell, or to prevent the enemy looking straight down the trench.

In winter, or after rain, the surface of the boards is greasy in the extreme, and sometimes they are completely under water. At night-time the difficulties, as may be well imagined, are greatly increased. Sometimes the turns in the trenches are so sharp that the traverses of the stretcher have to be closed in order to allow its passage round the corners.

Much ingenuity has been expended in devising stretchers for the easier transit of the wounded man, for getting round corners easily and relieving the work of the bearers, for the strain on the shoulders produces an intolerable ache in the neck. In some cases the stretchers are carried on the bearers' shoulders, the wounded man's legs lying in troughs projecting past the bearer's head, the idea being to shorten the "wheel base," as it may be called, of the stretcher party. In other cases the patient is carried almost upright on a stretcher that somewhat resembles the back board of a Swiss mountain porter. Many wheeled stretchers have been tried, but the inequalities of the ground and the sharp corners to be turned are difficulties which have not yet been overcome. Sometimes it is possible to put a man on the trolley-line and run him down over the open ground. In some cases the trenches have an overhead mono-rail on which a short form of stretcher can be suspended.

At the end of the communication trench the patient comes to the advanced dressing station. This, as a rule, is more spacious than the regimental aid-post, but is often similar in construction. Sometimes it is a ruined château—not quite the place that the word château may possibly call to your mind—a château is often a euphemistic name for a villa which would be equally at home in Clapham. Nearly all the houses—even the workmen's cottages—in Northern France have cellars, and these cellars have been really a godsend to the wounded. If the accommodation is not sufficient it is increased by dug-outs. These are made sometimes of heavy timbers covered with earth and sandbags, or at other times with sections of steel tubing commonly known as elephants, treated in the same way. At another time a farm or cottage is used. Here the cellars are again occupied, or the ground-floor rooms are made safe by building within them splinter-proof shelters formed of steel sheets and sandbags, and in some places where the subsoil water is found at a very shallow level shelter to the wounded is given by building splinter-proofs on the surface of the ground, heavily timbered and sandbagged. Although the medical arrangements are here a little more extensive and a larger supply of splints and appliances are kept, as a rule they are of a simple nature and used only to render the patient's transit as comfortable as possible.

Although many wounded men rest here the man with an abdominal wound, if his condition permits, is placed at once in an ambulance, covered up with blankets, and warmed by hot bottles. Here he is quickly taken in a motor ambulance to the tented section of the field ambulance. As a rule, the patient will not be removed from the ambulance, but he will be looked at by the medical officer and, if his condition is sufficiently good, at once sent on to the casualty clearing station. If the field ambulance happens to lie off the road to the nearest casualty clearing station the patient is, as a rule, taken straight to the latter, time thus being saved.

The field ambulance, or, as it is sometimes called, the headquarters or tented section, is usually situated in schools or some sort of public building; sometimes in cellars or dug-outs if the neighbourhood happens to be unhealthy. Usually such places are not shelled, but they are, as a rule, well within the range of hostile shell-fire.

The casualty clearing station is the first unit through which a man passes where adequate arrangements are made for operative treatment, the tendency being for all units in front of this to be merely concerned in the transport of the wounded or in doing very urgent surgery such as the arrest of hæmorrhage. In one of their functions—namely, that concerned with operations and after-treatment of cases that cannot bear further transport—our casualty clearing stations have become hospitals, and in them are all necessary paraphernalia for the performance of any surgical operation that may be required at this stage. They are situated out of the usual zone of hostile artillery fire. They have been estab-

housed in all sorts of buildings—schools, châteaux, asylums, tents, and huts; the arrangements, of course, are determined by the building. The tents have this advantage, that you can arrange your hospital as you like. Buildings are very comfortable in winter and are better lighted and more cheery, but very often are not so convenient, especially when the upper storeys have to be utilised. Huts possibly are the best of all, as they have the advantage of buildings and can be arranged on a considered plan. Unfortunately, they are not so mobile as tents.

In the recent fighting on the Somme the tented casualty clearing stations were the rule for the very good reason that no buildings were available. The general plan of these is as follows: There is a large reception-room made by lashing tents together to form a dressing-room. Here the wounded, arriving off the cars, are carried; here they are examined by the medical officers and particulars taken by the clerical staff. The lighter cases have their wounds dressed and are passed on to a series of tents called the "evacuation area," or they are at once put on to the train in which they travel to the base. The more serious cases are put into the "treatment area," and here their clothes are removed; they are cleaned up as well as possible, fed, and warmed. From here they are taken into the theatre, where their wounds are properly attended to, and from here they pass again into another tent in the treatment area where they remain until ready for transmission to the base.

Many clearing stations have a ward where men arriving in a grave condition are placed, and every attempt is made by warmth, food, and adequate means to bring them back into such a condition that they can be operated upon if necessary.

All casualty clearing stations, no matter where situated, have now very large operation accommodation; all of them have space enough to set up three tables at least. Every attempt has been made to provide long wooden huts for the theatres where there is a good light and where an adequate temperature can be maintained. These theatres are adequately furnished with all the appliances which are necessary for the performance of the operations which have to be done in such units. The staff varies according to the work it is called upon to do. The staff in pressure times may be three times the normal establishment, not only in medical officers, but in nurses.

The casualty clearing station has to be put in such a place that it can be easily reached by the ambulance cars and so arranged that the cars can be passed back on a different road from that on which they came, or by a road which allows of a double line of traffic. It is either on or near a railway, and by far the best arrangement is where it has a siding on which an ambulance-train can stand to which the patients can be transferred by hand-carriage straight from the tents to the train. This ideal, however, is not always obtainable, and then the wounded have to be taken by ambulance-car to the railhead. This, of course, means more labour for the personnel and more jolting for the patient.

Relative Frequency of Abdominal Wounds.

Stevenson says in recent wars 15 per cent. of the wounded are hit in the abdomen and about 4 per cent. reach hospital. In the Spanish-American War the percentage of abdominal wounds to total wounds was 2 6 per cent. In this present war the actual number of abdominal wounds will never be known, nor is it particularly important.

The number of abdominal wounds admitted to the field ambulance and casualty clearing stations are, subject to certain errors, known. The error is caused by the impossibility of accurately diagnosing the perforating abdominal wound. Since the onset of the operative treatment the error, of course, has diminished. The numbers, as a matter of fact, vary with each observer, and a surgeon who believes in the expectant treatment will be inclined to reckon as perforating the wounds which a believer in the operative treatment would place as non-perforating. The following figures were taken in certain casualty clearing stations by careful observers, but of different surgical persuasions, during a period in which the expectant treatment was paramount.

Percentage of Abdominal Perforating Wounds to Total Wounds.

(*a*) = 1·88 per cent.	(*c*) = 0·75 per cent.
(*b*) = 1·5 ,,	(*d*) = 0·62 ,,

If we take the statistics from nine field ambulances and certain casualty clearing stations over a period of six months we get the following figures:—

The Percentage of Abdominal Wounds to Total Wounds.

Field ambulances	1·92 per cent.
Casualty clearing stations	0·72 ,,

The difference between the figures in the field ambulance and casualty clearing station is accounted for in the following manner:—

1. The field ambulance will naturally and rightly err on the side of making the graver diagnosis.
2. The mortality was high in the field ambulances, so that fewer cases reached the casualty clearing station.
3. At the casualty clearing station a more careful diagnosis will act in two ways: (1) It will include some buttock, chest, back, and thigh wounds as abdominal wounds; (2) it will exclude many cases of wounds of parietes. On the whole, the effect will be to lessen the proportion of abdominal wounds to total wounds.

From these figures, which must be considered only approximate, the important facts stand out—namely, the relatively small number of abdominal wounds that a surgeon is called upon to treat, certainly under 2 per cent. of all wounded. The moral to be drawn is that one must not be led away by one's interest in abdominal wounds to spend more time and attention on them to the prejudice of the far larger number of wounds of a different part of the body. We must constantly bear in mind that all arrangements must be made so that the greatest good is done to the greatest number. If the number of medical men were unlimited this would not apply, but with a limited number of surgeons the best possible use must be made of their services.

Method of Recording Cases.

This paper is based on all abdominal wounds which reached an operating hospital from a certain sector of the line over a period of 18 months. In arriving at a conclusion of the mortality of abdominal wounds and what can be done for them by operative treatment it is necessary to take a sector of the line and to include all the cases, no matter at what hospital they are treated. Results do differ in different hospitals, more or less depending upon their distance from the firing line; they will also differ according to the nature of the fighting. Again, if times are quiet there is plenty of time to treat adequately and deliberately all cases. At another time, when active operations are in progress, it may be only possible to pay attention to the most favourable cases. It is also necessary not only to reckon your operative mortality but also to bring into account all cases which arrive too bad for operation. This has been done in the present series. In the case of the moribund cases we have their numbers, but we do not in every case possess details of the injury. The statistics were collected in the following way: Every hospital which was called upon to treat abdominal cases was provided with a book in which certain headings were written down and filled in at the time of operation by the medical officers. In the early days these books were Admission and Discharge Books altered for the purpose. Later on, by the kindness of the Medical Research Committee, we have had supplied books provided with adequate headings which could be quickly and accurately filled in.

Comparative Mortality of the Casualty Clearing Stations and Abdominal Hospitals.

The following figures show the differences in results which may be obtained in different hospitals under different conditions, and the necessity of including them all in your statistics if you wish to obtain an accurate result.

The following are the total mortality at four different hospitals during the same battle:—

(1) A casualty clearing station.	54 per cent.
(2) An advanced operating hospital	36·36 ,,
(3) An advanced operating hospital	82·64 ,,
(4) A casualty clearing station	72·73 ,,

(1) A forward casualty clearing station.
(2) Was never pressed. (Mortality here during 7 months was 54 8.)
(3) Very heavily worked, many cases arrived late.
(4) A back area casualty clearing station.

Time Factor.

The table below was compiled by dividing the time between the receipt of the wound and the performance of the operation into two-hourly periods and noting whether cases were sent

to the base or succumbed to their injuries. It mainly shows two things: (1) it gives some idea of the time in which cases are got out of the trenches and submitted to operation; and (2) it also shows the effect on the mortality of the time which has elapsed between the receipt of the injury and the performance of the operation. It will be seen that most cases

TABLE I.—*Effect of Time on Mortality.*

Hrs.	-2	-4	-6	-8	-10	-12	-14	-16	-18	-20	-22	-24+
	B. D.	B. D.	B. D.	B. D.	B. D.	B. D.	B. D.	B. D.	B. D.	B. D.	B. D.	B. D.
	2 2	13 17	35 21	28 35	18 20	11 12	4 4	3 6	8 10	2 6	0 1	22 43

• Hrs. = Hours. B. = To base. D. = Died.

To base.		Died.	
Hours.	Injury.	Hours.	Injury.
24	Colon.	6	Small gut and hæmorrhage
57	Bladder.	6	,, ,,
24	Sigmoid.	5	Gas gangrene of abdominal wall (post-operative).
30	No visceral injury.		
48	,, ,,	3	Hæmorrhage.
26	Jejunum.	4	Stomach and duodenum.
15	Stomach.	4	Small gut and hæmorrhage
65	Rectum—extra-peritoneal.	4	Stomach.
		6	Multiple wounds.
72	Colon.	3	Colon.

arrive some time between 6 and 10 hours after receipt of the injury. If over 12 hours the mortality mounts; above 24 hours it appears that there is very little hope of getting a good result.

To the table have been added a few cases in which patients have died after an unexpectedly short period and also those in which recovery has followed the elapse of a long period between the receipt of the wound and the operation. So far the limit of successful cases has been 36 hours for a resection of the small intestine and 36 hours for a suture of the colon.

WHERE TO OPERATE ON ABDOMINAL CASES.

From the operative point of view the sooner the patient is submitted to operation the better. From a post-operative point of view it is desirable to do the operation in some place where the patient can be kept quiet and properly nursed. It will be seen that for very obvious reasons it is not possible to satisfy both conditions. If you were to operate on a patient at the very earliest possible moment it would be in some place where the nursing was bound to be of a very primitive nature. It would also have to be in some place which is exposed to shell-fire. Now, shell-fire has a very bad effect on patients, and men who are well-nigh careless of its effects when active and in good health are very much upset by it when lying passive in bed. Again, you cannot well keep your sisters in such places, although on many occasions they have done magnificent work under conditions of this kind. Then, again, you must consider the greatest good for the greatest number—one must do what is best for the majority. The setting out on a large scale of the special advance hospitals means the dissipation of personnel, and medical officers, orderlies, and nursing sisters are none too numerous for the work they have to perform. Then, again, if you have special hospitals you have to have special arrangements for evacuation. It may be stated that the best place for a casualty clearing station is some 10,000 yards behind the line on a railway or canal with good roads leading to it. Taking it all in all this is the best place for abdominal surgery. Remember that most of the time in getting a patient to an operating centre is spent within the trench system; the road journey is short, and although there will be some shaking in a motor ambulance it will be a good deal less than the patient has already experienced during the period of hand-carriage. If a patient arrives at a casualty clearing station 10 hours after the receipt of a wound it will most probably be found that only 60 minutes have been spent in traversing the distance from the trench system to the casualty clearing station,

It may be well to say here something about the mobile operating vans. They have loomed somewhat largely in the public mind and have been a good deal discussed. The idea is that you can have the motor van fitted out as an operating room, and that such a van should seek the patient rather than that the patient should be brought to the theatre. It may be stated at once that this idea is impracticable, and much more time would be spent in getting to the patient than is now spent in getting the patient to an ordinary clearing station. When speaking of a mobile hospital-van it must be understood that one does not include in this category a theatre which can be rapidly erected, adequately warmed and lighted, such as the French have made use of on many occasions; such units are only meant to be mobile in much the same degree as the casualty clearing stations are mobile. On the other hand, special hospitals are very good under certain conditions. In the Army to which I am attached Surgeon-General Macpherson established two such hospitals, and Surgeon-General Pike another, and I will briefly describe them.

The first one, which we will call No. 6, was situated in a bleaching mill; it was about 5000 yards behind the firing line and took all the abdominal wounded of a certain corps. It was formed by sending an operating surgeon and an anæsthetist and four nursing sisters to supplement the personnel of a field ambulance which was situated in this building. It had a very good theatre and a large ward, which in cold weather was steam-heated. The evacuation arrangements were under the care of Colonel B. M. Skinner, the D.D.M.S. of the corps, to whose energy its success was greatly due. Here we got cases frequently within two hours or less, the patients being carried straight from the spot where they were wounded to the hospital, irrespective of what division they belonged to. This hospital was never pressed and never had the strain of a large fight placed upon it. It continued to do its good work until the enemy began to pay attention to a bridge which crossed a canal on whose banks the mill was situated. Then it was shifted a bit to one side and to another building which was much less commodious. There it remained until the area passed out of the jurisdiction of the Army. The sisters and operating surgeon and anæsthetist were then moved to a different part of the line and were re-established in the ugliest château it has been my misfortune to see. It was situated about 9000 yards behind the line and in a very much more difficult sector as far as evacuation was concerned. Here it continued to do excellent work, although the railhead and a coal-mine near by were continually shelled, many of the shells coming into the garden uncomfortably close to the house. It was closed at last, as a casualty clearing station was opened near by. Strange to say, the day on which it was closed was the last day on which the place was shelled. This hospital was also never pressed and the results, as in the last, were very good.

The third hospital was opened in a field ambulance just before the onset of a big battle; and it was arranged that all the abdominal wounded from a corps should be brought to it. As a matter of fact, in the stress of battle the wounded from two corps were carried to it. The result was that the place was heavily worked and the results were not so good as in the last two.

I will mention a fourth abdominal hospital, although it was not in the army to which I am attached, because there are some lessons which can be learnt from it. Experience had been gained by the overwork of the last hospital and adequate arrangements were made to prevent it in future. The personnel of this particular hospital was adequate for its needs. In addition, it was arranged that when the hospital became full the wounded should be sent on to a casualty clearing station situated somewhere farther back. The result of this arrangement was that all the abdominals that had the good fortune to be admitted were well and rapidly treated

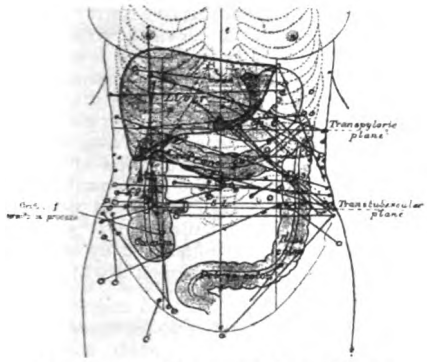
The lesson to be learnt from the experience gained at such hospitals can, I think, be summarised as follows: That in quiet times such hospitals opened at field ambulances by the provision of an operating surgeon and a few sisters can do magnificent work and save life. If, on the other hand, such hospitals are to be opened in times of battle, it is necessary to have very much the same personnel that is allowed by the establishment of a casualty clearing station.

ARRANGEMENTS AT THE PRESENT TIME IN THE FRENCH AND BELGIAN ARMIES.

It has been said above that the French and Belgians went through the same experience as ourselves. As the line became fixed, operation became the established practice. The French have established advance abdominal hospitals

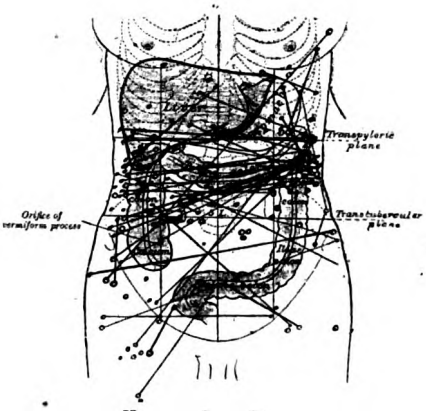
Charts showing the General Incidence of Fatal and Non-fatal Gun-shot Wounds of the Abdomen.

FIG. 1.



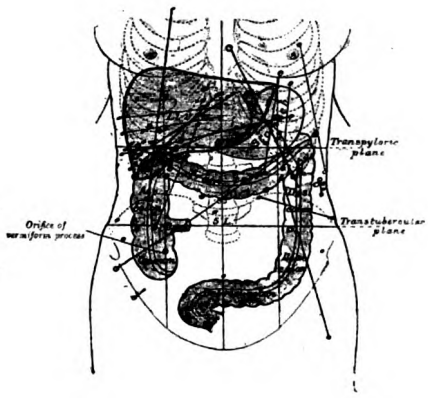
Cœliotomy. No wound of any hollow viscus. In a few instances a solid organ was hit.

FIG. 2.



No operation. Died.

FIG. 3.



No operation. Recovered.

These charts were made by indicating an anterior wound by a black mark, a posterior wound by a circle, and joining the two when they represented the entrance and exit wounds of a missile.

by means of what they call motor surgical ambulances; these are really hutted theatres which can be easily erected, and they are really extremely complete in their arrangements. These hospitals are pushed rather further forward than is the practice in the British Army, and have, I believe, met with a large measure of success.

Professor Tuffier also informs me that the French have established dug-out operating centres situated some hundreds of metres behind the trenches, where it is possible to operate on the wounded in from a half to two hours after the accident. He adds—which is of considerable interest—that with the very large attacks they have had and the great number of wounded they have had to be dealt with, this arrangement has not given very good results, for the reason that the wounded have arrived late, and very often these ambulances have been unable to deal with the numbers of wounded they have received.

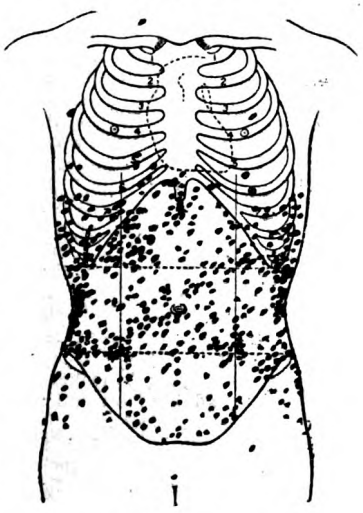
The Belgians have followed suit to a certain degree and have pushed their abdominal operating centres far forward and have lately provided special ambulances for the transmission of the operated man to the hospitals farther back. I have not so far ascertained what measures of success they have had, but the Belgians are favourably situated in that they have large base hospitals very close behind the firing line.

NATURE OF PROJECTILES THAT CAUSE THE WOUNDS.

Bullets.—There are very many different kinds of bullets used in this war, and apparently their number goes on increasing. As is well known, the standard English, French, and German bullet is a pointed one. The English and German is a composite projectile which is liable to break up into mantle and core. The French bullet is much longer than either of the above and is made of solid copper alloy. Although not liable to break up it is liable to very great distortion. Naturally, we are mostly concerned with the German projectile, which, as a rule, is pointed, but some times the old ogival-headed bullet has been extracted from wounds. All the modern pointed bullets are more unstable than the bullets of the Boer War. The instability is said to be most marked at the beginning and the end of the flight. Again, in this war, where the fight takes place amongst houses, there are many opportunities for the bullet to be deformed and deflected. Again, the velocity and stability of a bullet is largely affected by passing through sandbags or a parapet, which, as a matter of fact, has to be something like 4 feet thick to be bullet-proof. There is plenty of proof that, whether from inherent instability or from hitting some object, the bullet does spin, and in several cases a bruised impress has been seen on the skin which could only have been made by a sidelong impact of the bullet. Again, in those cases where two legs have been wounded by the same bullet the first leg has been perforated by a small standard track and the opposite leg has suffered a large gaping wound, the obvious explanation being that the bullet in passing through the first limb was made to spin and so caused a more extensive wound on the opposite member. A good deal has been heard about the explosive effect of the modern pointed bullet, and although one may say that it does cause worse wounds than the ogival-headed projectile, I am by no means persuaded that its so-called explosive effect is anything but a very rare occurrence. I am strengthened in this opinion by the study of accidental wounds, of which one sees a great number. Men are shot at all sorts of close ranges up to actual contact, and yet, unless a hard bone is touched, it is not usual to get the explosive type of wound.

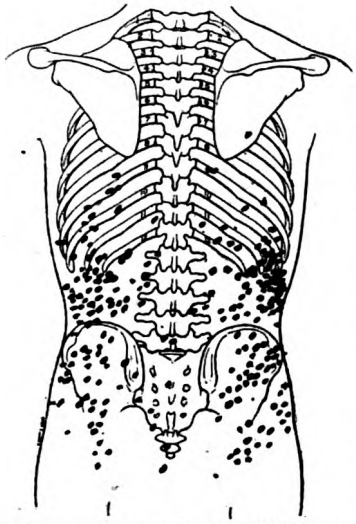
Charts showing the Regional Incidence of Wounds.

FIG. A.



Front view. 429 wounds. Mortality 53 per cent.

FIG. B.



Back view. 222 wounds. Mortality 60 per cent.

These charts were obtained by plotting the entrance wounds only.

Shell fragments.—These are, of course, of all sizes, but the fragments which are the cause of the abdominal wounds that the surgeon is called to treat are generally not more than 1½ inches in the greatest diameter, usually a good deal smaller. There are different kinds of shells used, and some importance may be attached to the nature of the shell by which the man is wounded.

High-explosive shells.—These shells may burst in the air, on contact with the ground, or after they have impacted themselves deeply in the earth. The velocity of the fragments into which the shell is

blown depends on the disruptive charge; and the fragments under such a condition fly out in all directions. The shape of the fragments depends largely on the type of shell—if the shell is segmented the pieces are more or less quadrilateral; if not segmented they have extremely sharp and ragged edges. Such shells, bursting on the ground, naturally become covered with dirt.

Shrapnel.—These shells usually burst in the air with a time-fuse. They are of all sizes and the leaden balls with which they are filled also vary somewhat in size. The penetrating power of such balls is due to the remaining velocity of the shell. The direction of the shrapnel balls will, as a rule, be downwards. In some cases apparently a shell is of a combined high-explosive and shrapnel type.

Bombs and grenades.—In the early part of the war these bombs were often extemporised and consisted of tin boxes filled with an explosive, scrap iron, cobblers' nails, and screws, &c. Now-a-days they are made of iron, the surface of which is marked with grooves, so that on explosion they break up into quadrilateral fragments. Sometimes the force of the explosive will cause a bomb to burst into smaller fragments, so that often they are no bigger than a big match-head. These fragments, although small, have apparently, from their high velocity, a very great penetrating power in the immediate neighbourhood of the explosion, although this is rapidly lost as the distance increases.

Trench mortars.—These are of various shapes, but consist essentially of a very large high-explosive charge with a comparatively thin containing envelope; they therefore burst very often into large ragged fragments as well as minute ones. They are generally timed to burst either on the ground or in the ground.

Bayonet wounds.—These are very seldom met with, being usually fatal on the field. Mention may be made of two cases. In the first the bayonet penetrated the man's back and came out by his umbilicus. No viscus was injured, and the man succumbed to hæmorrhage. The second was the case of a man who was late in answering a challenge and was bayoneted by the sentry. The bayonet entered the left hypochondrium and wounded the stomach near the greater curvature and entered the back wall of the abdomen. Though promptly operated on he died, not of his stomach wound but of retro-peritoneal sepsis.

RELATIVE NUMBER OF DIFFERENT PROJECTILES AND THE PROPORTION RETAINED.

Table II. has been drawn up with the intention of giving some idea of the relative frequency of the different projectiles met with in abdominal wounds; it also shows the relative number retained in the body. Now this table must be taken as

TABLE II.

Bullet.		Shell fragment.		Shrapnel.		Bomb or grenade.	
Out.	Retained.	Out.	Retained.	Out.	Retained.	Out.	Retained.
181	103	24	151	10	52	6	82
284		175		62		88	

only relative for several reasons. In the first place it is often impossible for a man to tell what hit him. In the second place one cannot always be sure from a study of the entrance and exit wounds what was the nature of the projectile; and, again, many do not differentiate between high-explosive shell and shrapnel, the soldier generally including most shells which are not of a large calibre under the name of shrapnel. As a matter of fact, there is very little difference in the nature of the fragments in high-explosive shells, bombs, rifle grenades or trench mortars if one excludes the larger fragments with which we are very little concerned.

Bullets.—Bullets and high-explosive shells furnish a large proportion of abdominal wounds. More bullets pass through the body than other projectiles. The reason for this is obvious. The causes for retention are not so obvious, and I have known bullets fired at a comparatively short distance remain within the body. In other cases the bullet may have passed through the earth and so have had its velocity diminished. Ricochets account for a certain number.

Shells.—These show a high proportion of retention. This is obviously due to the shape of the fragments. Shrapnel shows a large proportion, and this is no doubt due to the small velocity and round shape.

Bombs and grenades.—The retained fragments are strikingly in excess of those passed out. The large proportion of retained fragments at once suggests the possibility of armour; and, no doubt, armour could be devised which would keep out many fragments. It really is more or less a question of what the soldier is able to carry. One cannot help being struck with the resistive power of an ordinary book, as one has often seen projectiles arrested by such articles when carried by the soldier. The great saving of life produced by the steel helmet makes one hope that something could be produced which would be equally efficacious in protecting the body. Although we could not expect such shields to be supportable and bullet proof, yet the number of passed-out bullets is far out-numbered by the number of retained bullets, shell, and bomb fragments which possess far less penetrative power.

RELATIVE MORTALITY OF THE DIFFERENT PROJECTILES.

TABLE III.

Bullet.		Shell fragment.		Shrapnel.		Bombs or grenades.	
To base.	Died.	To base.	Died.	To base.	Died.	To base.	Died.
50	63	46	65	10	21	30	31

There is nothing very much to be learnt from this table, except that bullets are as dangerous as other projectiles, and that bombs and grenades seem to be the least noxious.

THE IMPORTANCE OF
THE DIAGNOSIS OF ENTERIC FEVERS BY AGGLUTININ DETERMINATIONS.

BY E. W. AINLEY WALKER, M.A., D.M. OXON.,
CAPTAIN, O.T.C. UNIV. OXON.; FELLOW AND TUTOR OF UNIVERSITY COLLEGE, AND LECTURER IN PATHOLOGY IN THE UNIVERSITY OF OXFORD.

(Report to the Medical Research Committee.)

IN the course of recent criticisms directed to this subject several points of interest have been raised, and some misapprehensions have become evident which it may be of advantage to consider briefly. They are dealt with in the order of their publication.

I.—In a discussion on "The Technique of the Agglutinin Test" Dr. P. N. Panton[1] strongly dissents from my contention that "the microscopic method entirely fails *to give comparable quantitative measures of the titre of a patient's serum on successive occasions.*" He considers the microscopic technique commonly employed to be fully adequate for this purpose. In defence of this view he expresses certain opinions regarding the constancy of the materials employed, the general accuracy of the microscopic technique, and other matters whose validity ought not to pass unchallenged. Yet merely to deny Dr. Panton's statements categorically would not assist in illuminating the subject, while to explain in detail *ab initio* the reasons why they are misleading would require not only a repetition, but also a considerable amplification of my previous Note.[2] For he places one in this dilemma, that he makes statements contradictory of well-established evidence, much of it old and quite familiar, but at the same time he omits to adduce any experimental data in support of his position, such as could be submitted to critical analysis. In some cases he seems actually to be unaware of the factors which militate against accurate quantitative results in the performance of agglutination tests. For example, he still (so far as one can judge) makes the successive dilutions of a serum by adding more and more bacillary suspension, in apparent unconsciousness of the effects of the mass influence of bacteria on the absorption of agglutinins. These effects, however, are such as to render it essential that the serum, whatever its dilution, shall always operate on equal masses of bacteria if accurately quantitative observations are desired. Fortunately many of Dr. Panton's

arguments have already been admirably dealt with by Glynn.[3] It may therefore suffice upon the present occasion to meet his contentions regarding the value of the microscopic method for the purpose under discussion by examining its performance in the only direction in which he has brought forward definite experimental evidence. These observations of his own afford very valuable information. For though he himself interpreted them guardedly as evidence in favour of the exploded theory that in inoculated persons any febrile condition of a certain duration causes, or may cause, disappearance of the inoculation agglutinins, they serve in reality quite a different purpose. They prove to demonstration that the microscopic method as employed by him cannot for accuracy and reliability support any comparison with results obtained by the use of Dreyer's macroscopic technique. Indeed, his figures show that the results obtained by the microscopic method, even as regards the mere detection of agglutinins without considering the question of their measurement, are very much worse than one would have ventured to suggest was probable had these data not been supplied. The results of typhoid agglutination tests are recorded by Dr. Panton for 72 out of 100 consecutive cases in inoculated individuals who had suffered from various febrile conditions. They are tabulated below alongside the results for the first 100 similar cases examined by myself by Dreyer's method.

Cases examined by the microscopic method (Panton).		Cases examined by Dreyer's method (Ainley Walker).	
Typhoid agglutination.	Per cent.	Typhoid agglutination.	Per cent.
"Completely negative."	62·4	Nil, 1 in 25.	0
"Negative or partial."	16·7	"Standard," or trace 1 in 25.	3
"Positive."	20·8	"Standard," 1 in 50 or more.	97

By Dreyer's method every case showed measurable quantities of agglutinin in 1 in 25 dilution of the serum, and 97 per cent. showed "marked agglutination visible to the naked eye" in at least 1 in 50, and frequently in very much higher dilutions. But in the cases examined by Dr. Panton by the microscopic method the test was "completely negative" in nearly two-thirds and "positive" in only about 21 per cent. Nothing could be more convincing as regards the relative delicacy, reliability, and general accuracy of the two methods for the detection of agglutinins. A fuller justification could, indeed, hardly be found for my criticisms of the microscopic method than that here provided by Dr. Panton's own observations.

II.—In a letter to the Editor of THE LANCET Captain R. P. Garrow[4] makes some interesting comments on my recent "Illustrations of the Diagnostic Value of Agglutinin Determinations."[5] And one may certainly be permitted to endorse his plea for judgment and caution in the interpretation of the results of agglutination tests, particular regard being had to the methods employed. Probably we are much more nearly in agreement than the incisive character of some of his expressions might suggest. But in charging me with ignoring clinical observation as a means of diagnosis in enteric fevers he misunderstands me. My article was not concerned to discuss the clinical diagnosis of enteric fevers. To do so would be quite beyond my province. The point which it was desired to emphasise is that when and wherever these infections are abroad many mild and atypical cases may occur which are *not capable* of diagnosis by clinical observation alone. Moreover, in every case the differential diagnosis between typhoid, paratyphoid A, and paratyphoid B still rests, and is likely to remain, with the pathologist. The cases charged in my article purposely included a number of such mild or atypical attacks. And the fact that among the mass of cases which receive the provisional diagnosis "pyrexia of uncertain origin" cases of enteric fever may be numerous and important, that they form a grave source of danger, and that the agglutination test (even as commonly applied) affords the *best* criterion for their diagnosis is emphasised by competent authority, as follows (all italics mine):—

Osler and McCrae: System of Medicine, Vol. II., p. 178.—"Mild Typhoid Fever.—This is an exceedingly important group, especially as regards prophylaxis, for these mild attacks may not be recognised, *and the patients are the means of spreading the disease.* ..... The cases may be divided into two classes, the first including those characterised by a mild and short course, the other those in which despite the short course the onset is severe. ..... *In many instances these mild forms are taken for malaria*, mountain fever, &c., while doubtless they are not uncommonly put down as *febricula*. .....The recognition of this group comes through one of two ways. They may show characteristic signs, ... *or be recognised only through the routine Widal reaction.* .....We are not sufficiently impressed with the importance of this group. Keeping their frequency in mind, the physician will watch more closely *and have the agglutination reaction tried more frequently* in patients with mild fever. ..... *For the community the recognition of this group is most important* ....."

If the foregoing statements were valid before the introduction of protective inoculation, much more are they so in relation to the character of enteric infections in inoculated persons, among whom the relative proportion of mild, abortive, and atypical attacks will naturally be higher than among non-inoculated individuals. Thus it appears that in urging the importance of relying on agglutination tests for diagnosis in such cases one is not guilty of ignoring clinical observation, but can claim the strong support of clinical teaching.

That the facts thus indicated were quite fully recognised by experienced observers who have worked upon the epidemiology of enteric infections is illustrated in the subjoined quotations from an article by Grattan and Wood[6] on paratyphoid fever in India, where the case is stated plainly and with great cogency.

"In the first place, owing to the mildness of the disease in some instances, patients are not diagnosed paratyphoid, but influenza, tonsillitis, pyrexia of uncertain origin, rheumatism or pneumonia, with the result that they are sent out of hospital within a few weeks of going sick, and may return to barracks while still infectious. In the second place, such convalescents are frequently sent with other debilitated men to the hills during the hot weather, and thus the hill stations where men of several corps mix together may serve as distributing centres of the disease. Furthermore, the ambulant case is in reality ....."

"An epidemic is started from one acute carrier, the nature of whose illness is not recognised owing to its mildness. He infects other men, some of whom are recognised as cases of paratyphoid; others, again, are not diagnosed, and possibly others never report sick at all. These men soon return to barracks and come in contact with other men in soldiers' homes, &c.; and though probably only infectious for a few days manage thus to disseminate the disease."

With regard to the interpretation of agglutination results, Captain Garrow expresses so clearly exactly what ought to be done in carrying out an investigation of this problem that his terms may well be quoted (italics partly mine):—

"..... blood culture should be performed at once. ..... Whatever the result of the blood culture, agglutination tests by a strictly quantitative method should be performed and repeated at suitable intervals. ..... The object of this procedure in a case in which an absolute diagnosis by blood culture has been obtained is ..... to furnish *agglutination results controlled by blood culture. The data so obtained are essential as a guide to the interpretation of agglutination results in other cases* in which blood culture has failed to give a diagnosis ....."

But Captain Garrow appears to have overlooked the fact that this fundamental work is precisely what has already been done on a very considerable scale. And there comes a time in the conduct of investigation when the evidence accumulated seems to be sufficient to convince observers that the guide thus obtained may be relied upon, and that the problem may in certain aspects be regarded as solved. Now the evidence obtained by Dreyer[7] and his co-workers in very long series of cases is that *in every case* bacteriologically proved to be typhoid or paratyphoid B, and also in similar cases of paratyphoid A (since the low level of agglutinin titre found even at the maximum in many cases of this infection was fully recognised), the diagnosis independently arrived at by means of agglutination tests carried out by Dreyer's method was *proved* to be correct. Results of such a character may fairly be termed a *uniformly accurate diagnosis.* They would seem to justify my statement—not in the extravagant interpretation placed on it by Captain Garrow "that agglutination tests alone *invariably* furnish an *absolutely infallible* diagnosis"—but in the form in which it was made, and with the limitations carefully specified in the article, that such tests "..... can be made to yield a uniformly accurate diagnosis in cases examined during active infection." The limitations specified and repeated from a previous article by Dreyer and myself[8] were that a diagnosis should not be based on a rise of titre of only 100 or 200 per cent. if it is clear that the maximum of that rise falls markedly outside the period sixteenth to twenty-fourth day of the disease. We further stated that so far as experience at present goes, if a regular rise and subsequent fall, even of only 100 or 200 per cent., occurs in the typhoid (or paratyphoid) agglutinin titre of the serum, and its maximum

clearly falls between the sixteenth and twenty-fourth day from the onset of illness, the case is likely to be one of typhoid (or paratyphoid) infection. It would be prudent, therefore, that it should be so regarded under present conditions, when the circumstances are such that it is a prime object to prevent the escape of undetected carriers. For every case that is missed is a potential carrier of infection.

Captain Garrow further takes exception to my use of the graphic method in joining successive points on the charts of agglutinin titre by *curved* lines, which he terms "figments of imagination." Here he is rather led astray by a telling phrase. It is, of course, in one sense never possible to do more than speculate (more or less logically) regarding the course of nature between points of observation. One was therefore careful to speak guardedly of these interpolations as "curved dotted lines ..... *to indicate approximately the probable form* of the agglutinin curve." But it is surprising that Captain Garrow should express a desire to see the points jointed by *straight* lines. For a little more consideration would have shown him that such straight lines would not only equally be figments of imagination, but they would also be deliberately *misleading*. If there is one fact more than another that has been firmly established for years, it is that both the rise and fall in the agglutinin titre of the serum follow *curves*. Why, then, draw straight lines if one wants to illustrate what one thinks is probably occurring between points of observation?

To turn briefly for a moment from the general to the more particular. Captain Garrow very properly draws attention to a bad slip of the pen in a recent article by Professor Dreyer and myself in stating the maximum of a curve lies between the two highest readings, when we should have said on one side or other of the highest reading. But, as he notes, the correct principle is followed in my charts. In reference to Chart 6, in which the T. estimations exhibit a progressive fall, the reason why a maximum is placed between the first two readings is that, as can be seen at once by plotting out on a large scale, a smooth curve through the last five points will not pass through the first. Incidentally, this shows how information is gained from the use of *curved* lines of interpolation. In Chart 10 the reason for the diagnosis "clearly a case of B. infection" is given in the letterpress attached, if read in conjunction with the whole of note 3.

Case 4 of my article receives some special criticism. In publishing this chart attention was drawn to the fact that the case had "simulated a tertian ague." It was selected for publication partly to illustrate the fact (see Osler and McCrae above) that such cases may be *mistaken for malaria*. The clinical data given were a headache, a shivering fit accompanying the first sharp rise of temperature, and two more sharp rises of temperature on the third and fifth day (though without definite chills). The blood was examined for malarial parasites, but none were found, and a *typical typhoid agglutinin reaction was observed*, as shown in the chart. On this evidence Captain Garrow regards the case as one of malaria, but it is quite impossible to assent to such a diagnosis. The patient came from the Mediterranean area, where he had had prolonged fever, associated with severe intestinal disturbance, and he appears to have suffered, at any rate, from paratyphoid A and paratyphoid B infections (mixed or consecutive; *vide* chart). There was no indication of malaria in his history, and he had been three months in England when he was seized with the brief pyrexial attack under discussion and developed an extremely characteristic typhoid agglutinin reaction of moderate grade. Captain Garrow writes in a way that might convey the impression that he supposes every brief tertian periodicity of pyrexia with a chill at the onset to be necessarily of malarial origin. But he is, of course, aware that this is not the case. Repeated chills may occur, with or without marked periodicity, in various stages of enteric fever (to go no further afield) *vide* Osler and McCrae, loc. cit., p. 115, where a chart of enteric fever is given, *showing seven successive periodic chills* (cp. also Osler and McCrae, p. 105, and Allbutt and Rolleston's "System of Medicine," 1905, vol. i., p. 1108 and p. 1132).

III.—Captain H. Graeme Gibson's letter in THE LANCET of Jan. 13th, 1917 (p. 78), follows quite a different line of criticism. In effect the letter pointedly suggests that Dreyer, Ainley Walker, and A. G. Gibson[9] have ignored or are ignorant of (it is not clear which is intended) certain earlier work, which had proved long before the same facts as they imagine themselves to have established more recently. In doing so it, of course, tacitly admits that the facts in question have become established, and on this account its appearance marks an important stage in the gradual crystallisation of opinion regarding the diagnostic value to be attached to systematically repeated and exact agglutinin determinations. But Captain H. G. Gibson is entirely mistaken in his conclusions.

Medical science is deeply indebted in very many directions to the admirable studies carried out by officers of the Royal Army Medical Corps, and it is a matter of particular regret to the present writer that he is compelled—not, be it noted, by any claim or action on the part of authors themselves, but by the misleading charges advanced (however disinterestedly) by Captain H. G. Gibson — to bring under criticism work which constituted at the time a valuable and successful endeavour to advance knowledge in regard to enteric infections, particularly in the domain of epidemiology. This task, which is not undertaken lightly, is rendered personally somewhat less repugnant by the fact that, whatever share may be assigned to his co-workers, any results which may have been attained by the Oxford School of Pathology are pre-eminently due to the scientific insight and experience of my friend and colleague Major Dreyer, now absent on active service.

The statements contained in Captain H. G. Gibson's letter may now be dealt with. Dreyer, Ainley Walker, and A. G. Gibson did not ignore the earlier work referred to.

1. There is no suggestion in any of the authorities whom Captain H. G. Gibson quotes either of the need for accurately quantitative measurement of agglutinin titre, or of a technique and materials by means of which such measurements could be made.

2. Nor is there either the statement, or the evidence to prove it, that reliable diagnostic data can be secured by the systematic repetition of exact agglutinin determinations at appropriate intervals—three to five (or more) successive determinations at intervals of from three to five days.

3. The curves reproduced by Captain H. G. Gibson marked no new departure in pathological investigation. For accurately determined curves of agglutinin titre had been published, at any rate since 1902, by Madsen and Jörgensen, Dreyer and Schroeder, Widal, Dreyer and Ainley Walker, and others, before the appearance of the communications referred to, and were presented in greater detail and with more exacitude.

4. The problem of the diagnosis of enteric fevers in inoculated men by means of agglutination tests became important in India and elsewhere from the period of the re-introduction of typhoid inoculation in the Army in 1905, but it remained unsolved, although the key to its solution had been provided in the work of Madsen and others just mentioned and in the improvements in technique devised by Madsen and by Dreyer.

5. As regards the observations of Grattan and Harvey[10] and Grattan and Wood,[8] *we made reference to them* where they were germane to the purpose in terms of which the opening sentence ran as follows[8]:—

"It is in absolute agreement with the important and careful observations carried out by Grattan and Harvey, and Grattan and Wood some years ago in their investigation of paratyphoid fever in India."

6. As concerns the quotations taken from reports on the enteric fever depôt at Naini Tal, they do not represent the views which we maintain. Had we referred to them it could only have been to express our very strong dissent from a number of their conclusions—for example:

Naini Tal Reports.	*Comment.*
"In paratyphoid fever the Widal reaction is *invariably* raised for the *B. typhosus*."	It is not *invariably* raised.
"In all cases of fever in inoculated men the blood should be taken *near the beginning* and *towards the end* of the fever. If the two results are the same the case is probably not enteric."	This is not necessarily true, for a marked rise and fall in titre may have occurred between two such distant determinations. We regard three determinations as the normal minimum. And we should consider it quite deplorable to wait until towards the end of the attack before attempting to secure a diagnosis.

In opening his criticism Captain Gibson takes exception to a statement of ours which offered a very moderate presentation of the facts existing at the time when it was written (December, 1914). He states that since 1905 repeated observations of the serum agglutinin content have been

taught at the Royal Army Medical College "*and carried out* by Army bacteriologists." But the first sentence of his own quotation from the Naini Tal reports throws an interesting light upon the latter claim, and in itself goes far to justify our statement.

Statement by Dreyer, Ainley Walker, and Gibson.	*Naini Tal Report.*
"It is probable that the absence of accurate diagnosis in the past explains the fact that statistical results arrived at in our Army have *not always* been so convincing as would otherwise have been the case."	"Some of these *errors in diagnosis* are due to the fact that the men had been inoculated, and therefore their blood gave a positive Widal reaction, and they were *diagnosed enteric fever on the strength of this alone.*"

Captain Gibson then proceeded to urge that—

"The necessity for using Dreyer's technique ..... is not apparent, and equally reliable results can be, and have been, obtained when using *Hiring* suspension of bacilli, '*provided the suspension is standardised.*'"

This shows that the writer has failed to understand what is meant by *standardisation of the agglutinability* of a bacterial suspension. The standardisation of the agglutinability of living suspensions is no doubt theoretically possible, but for any practical and routine purpose it is quite out of the question. Indeed, one is almost driven to the hardly credible conclusion that, with Dr. Panton, Captain Gibson supposes the determination of a given opacity or number of bacilli present per c.c. of the suspension to constitute the "standardisation" of an agglutinable culture.

At the end of the letter a case is stated against Dreyer in error, and with a degree of injustice which might have been avoided had the writer studied more attentively the authorities he quotes. He points out that Grattan and Wood mentioned in 1910 the frequency of *low* titre of serum in paratyphoid A, and would appear to suggest that Dreyer was still ignorant of this fact in 1915, although Grattan, Dreyer, and Wood had been working together. This suggestion is based on Dreyer's statement that "for a considerable time I did not know *how low* is the agglutination given by paratyphoid A in certain cases." But the explanation lies in the meaning of the words "*how low*" and in their context. Grattan and Harvey[10] found in 7 of their 8 cases "*low* dilutions (20 to 40), and always incomplete." Grattan and Wood[6] mentioned that they *had seen* cases where the agglutination did not reach 1 in 10. Their statement with regard to diagnosis in paratyphoid A is given below, along with the *context* of Captain Gibson's quotation from Dreyer.

Grattan and Wood[6] (1910).	*Dreyer[7] (1915).*
"..... a positive agglutination for this organism in a dilution of *1 in 20* is, in our opinion, *very strong evidence* of the nature of the patient's fever."	"One had always taken *1 in 25* as the limit below which no positive diagnosis should be made. But in the case of paratyphoid A that is wrong. If one uses standard cultures, and follows the technique laid down for their employment, I am now convinced that an agglutination of *1 in 10* is for all practical purposes *diagnostic* in cases of paratyphoid A.

This (1 in 10) was *the degree of lowness* of titre for positive diagnosis, of which Dreyer (and everyone else) was previously unaware. And no one had ever before suggested that paratyphoid A could be diagnosed with certainty (in non-inoculated and T-inoculated persons) on so low a titre. So far was the fact from being already familiar that Leishman[11] was even then unable to accept it, remarking with regard to this conclusion of Dreyer, "Personally, I think he goes too far because of the very low dilutions to which he attaches importance." Dreyer, Grattan, and Wood worked in association for a considerable period, and ample time has passed since Dreyer's statement was made for Grattan and Wood themselves to have drawn attention to any infringement of their priority had such existed. It can constitute no breach of confidence of any kind to state that Lieutenant-Colonel Grattan and Captain Wood were the first officers in the Royal Army Medical Corps to recognise fully the value of Dreyer's method and to make use of it consistently.

References.—1. Panton: THE LANCET, 1916, ii., 750. 2. Ainley Walker: THE LANCET, 1916, i., 17. 3. Glynn: THE LANCET (Correspondence), 1916, ii., 877. 4. Garrow: THE LANCET (Correspondence), 1916, ii., 1037. 5. Ainley Walker: THE LANCET, 1916, ii., 896. 6. Grattan and Wood: Journal of the R.A.M.C., xvii., 148. 7. Dreyer: Proceedings of the Royal Society of Medicine, 1915, Medical Section, p. 10. 8. Dreyer and Ainley Walker: THE LANCET, 1916, ii., 419. 9. Dreyer, Ainley Walker, and Gibson: THE LANCET, 1915, i., 324. 10. Grattan and Harvey: Journal of the R.A.M.C., xvi., 9. 11. Leishman: Proceedings of the Royal Society of Medicine, 1915, Medical Section, p. 19.

AN EASY AND RAPID METHOD OF

DETECTING PROTOZOAL CYSTS IN FÆCES BY MEANS OF WET-STAINED PREPARATIONS.

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IT is of the highest importance to single out from among those previously infected or exposed to infection the small but dangerous minority who form the little band of *histolytica* carriers. This involves the expenditure of an enormous amount of time on the very necessary routine examination of all suspected fæces in order to detect the presence of protozoal cysts, more especially those of *Entamœba histolytica*. To fix and stain films from each of the large number of specimens requiring examination is impracticable owing to the amount of time involved.

The usual method of detection is to examine wet preparations, which is done, as a rule, in one of the two following ways. Having determined the existence of cysts by their higher refractility in a wet film preparation of fæces in normal saline, another similar film is made in which, however, the saline is replaced by Gram's iodine. This method obviously involves the making of two separate films. In the alternative method the first step as above described is omitted, and only a wet Gram's iodine preparation examined. The object in using iodine is to bring out sufficient detail—more particularly the nuclear structures—in order to differentiate between cysts of *Entamœba coli* and *histolytica* respectively.

These methods are open to two important objections. The first, involving as it does two separate preparations, takes up too much time. In the second place, as the iodine in both methods stains the food débris more or less deeply, there is not sufficient colour contrast between the cyst and the débris surrounding it to enable it to be singled out rapidly and with certainty. Where cysts are very few in number, even an expert at such examinations may miss the occasional cyst on which a diagnosis alone may rest, while those less expert must spend a considerable amount of time carefully scrutinising everything in the film, and even then will probably frequently be in error. The lack of contrast in such preparations where there is so much similarly stained material to distract the eye, necessitates considerable concentration on the part of the observer, involving a greater expenditure of time and labour, and consequently allowing a greater loophole for error.

In order to reduce the amount of time spent on such examinations to a minimum and to render it almost impossible for even a novice to fail to detect the presence of cysts, I have devised the following stain mixtures. After trying various proportions, it has been found that a mixture of equal parts of the two stains used in any of the three following combinations will yield the best results.

A. Five per cent. aqueous solution of KI saturated with iodine to which is added an equal volume of either—

B. (1) A saturated aqueous solution of rubin S; or
(2) A saturated aqueous solution of eosin; or
(3) Stephens's scarlet writing fluid.

(*Note.*—1. I have found it necessary to specify this particular brand of red ink as some brands are useless for the purpose. 2. Basic fuchsin cannot be used.)

A few loopfuls of one of the above stain combinations are placed on a clean slide, a loopful of fæces taken and rubbed up with the stain to form a fairly smooth suspension, and a clean cover-slip gently lowered over the drop. To get the best possible definition it cannot be emphasised too strongly that the film so made should spread out under the cover-slip by capillarity so as to form the thinnest possible layer—preferably a layer which is no thicker than the diameter of a *coli* cyst. Obviously no gross particles must be left in the film, otherwise the cover-slip will not lie flat. The exact amount of stain to place on the slide will soon be learned after one or two attempts, and will depend on the size of the platinum loop employed and the size of the cover-slip. It is also preferable, although not essential, to mix afresh for each day's use the two elements of the combination stain.

I wish to point out that the way in which the film is made is a point of considerable importance, especially where rubin S or, to a less extent, eosin has been used in the combination; for if the layer of fluid between the slide and cover-slip be too thick the superfluous film of fluid overlying the cyst tends to render the latter less bright. In the case of cysts of the size and shape of *E. coli* or *histolytica* this makes very little difference, but if one is hunting specially for cysts of *Lamblia intestinalis*, and still more of *Tetramitus mesnili*, the colour contrast is not so marked owing to the smaller size of the cysts and the consequent thicker red layer of fluid overlying them. Where the worker has not acquired sufficient dexterity in making such a film, the difficulty may be got over by his using rubin S or eosin of only half saturation in the stain combination, or by employing the scarlet writing fluid above mentioned. In this way the effect of the super-imposed deeper red is to some extent obviated.

Another point to be noted is that where pressure has been applied to the cover-slip to cause the film to be spread out, many of the cysts, especially those of *Entamœba coli*, will be seen stained red by the red element of the stain combination. This is due to the fact that the cystic sphere is very easily ruptured, thus allowing the red stain to penetrate. Close examination of such red cysts will invariably demonstrate some rupture in the continuity of the cyst wall, which, as long as it remains intact, prevents the penetration of the red dye. Outside such cysts part of the contents or one or two nuclei can often be seen lying more or less closely apposed to the rupture. While the vivid contrast between cyst and background is not so marked as in the case of non-ruptured cysts, it is nevertheless almost impossible to miss recognising them, as they stain a deeper tint of red than the surrounding background, while the nuclei are just as distinct and as easily demonstrated as in the unruptured cysts. It is here not a question of the cyst being degenerated, but merely of the healthy cyst being ruptured. With the eosin or ink combination such a cyst stains a bright cherry-red, while with the rubin S combination it is more of a terra-cotta tint.

In a wet preparation stained according to the above directions, there is a more or less homogeneous red background from which the cysts stand out as brilliant yellow or greenish-yellow spheres which even the veriest tyro cannot miss seeing. Such cysts have a very sharply defined outline which in the case of *coli* and *histolytica* cysts appears, in the rubin S combination, using daylight as the illumination, as a sharp deep purple ring. In the case of other cysts this well-recognised outline is not so deeply coloured, although it is still tolerably sharp. The nuclear structures in the cyst stand out as prominently as with the old simple iodine method. Of course, where the light is too strong it may be necessary to close the iris diaphragm slightly to bring the nuclei into relief.

The method of stain which I here recommend is not, I need hardly say, a stain which will allow of a differentiation between cysts of *Entamœba coli* and *histolytica* respectively. The various points which, in doubtful cases must be considered before a definite opinion can be given, must be gone over in specimens treated with the above stain combination equally as in the simple Gram films. Where the examiner feels that it is necessary to measure the diameter of the cyst in order to differentiate between *E. coli* and *histolytica* respectively, the wall of these two types of cyst is so sharply defined and so prominent—as above mentioned—that with an eye-piece micrometer measurement is easily and accurately made, inasmuch as the halation seen in simple Gram-stained preparations is completely eliminated.

Although it is not pretended that the new stain combination can be definitely used as a means of distinguishing between cysts of *E. coli* and *E. histolytica* respectively, there are one or two points about the staining properties which, to one who has examined many specimens, suggest the possibility of differentiation, although I am not prepared to say at present that in every case these can be relied on solely. In the case of cysts of *E. coli* and *E. histolytica* and of the so-called iodine bodies, to take the cysts most likely to require differentiation, there is to the practised eye a slight shade of difference in the colour-tone of the first two as compared with that of the iodine body. There is a less vivid colour in the case of *histolytica* as compared with *coli*, which is the most brilliant object of all in the field with the exception of plant hairs. With a low power the nuclei of *coli* cysts are easily seen as a rule, while those of *histolytica* are less evident. The iodine body appears less vivid than the *histolytica* cyst, probably partly by reason of the large iodine-stained masses which it contains. Its luminosity is less. Even with a low power, however, it is easy to differentiate the so-called iodine body from *histolytica* or *coli* cysts, inasmuch as the first-named shows a well-defined round body at one pole which stains a very intense brown colour. Its outline is so sharply defined and its depth of colour so intense that it is easily differentiated from the immature *coli* or from the *histolytica* cyst, which happens to contain a vacuole which takes up the iodine stain. Such a vacuole is rather diffuse, has no sharply-marked outline, and is such a faint brown tint that its margins seem to shade off into the surrounding colour of the cyst. Another point of difference between the so-called iodine body and the cysts of *coli* and *histolytica* is that the outline of the first-named is not represented by such a definite and sharp deep purple line.

There is an indication also of a slight difference between cysts of *coli* and *histolytica* respectively on close examination of the contents. Cysts of the latter type seem to present a slightly more granular appearance than those of *coli*. This lessened granularity in *coli* cysts may partly account for their extremely vivid brilliance. In this connexion it is interesting to note that the granularity of the so-called iodine bodies appears to resemble that of *histolytica* cysts, and this together with one or two other points might suggest some definite relationship between the two. I do not, of course, mean to say that because of this one supposed similarity the so-called iodine bodies are to be regarded as *histolytica*.

It is to be noted that apart from using a combination stain mixed fresh each day it is also of importance to see that too much food débris is not used to make the film preparation. Where this precaution is neglected the iodine may be all absorbed by the gross matter present, leaving the cysts perfectly colourless. A little practice in making just the correct type of film will obviate this.

The only other objects likely to be met with besides protozoal cysts which take on this vivid greenish-yellow are plant hairs and a few mould spores. The former, described in a former paper, are easily recognised for what they are,[1] while the latter can be differentiated from cysts by their shape or size and by the absence of the characteristic markings of the various types of protozoal cyst. The vivid colour of plant hairs suggests that the walls of these protozoal cysts are composed, like the plant hair, of cutin. *Blastocystis hominis*, on the other hand, always stains a cherry-red or terracotta colour according to the stain combination used. The large vacuole which is here contained takes on the same tint as the background, while the nuclei pushed to the side stain deeply, as described in the last sentence. They are of vegetable origin and possess very thin walls, and with the combination stain described in this paper it is impossible for them to be confused with true protozoal cysts, as is sometimes done by the inexperienced when the simple iodine stain is employed.

What are probably dead leucocytes stain apparently varying tints of brown to greenish-yellow. All the other débris takes on a more or less brownish tint, while bacteria remain practically unstained, or, if they do stain, the deep red background in which they are prevents them, owing to their size, from becoming obtrusive and so distracting to the eye.

The background, therefore, in such preparations is a more or less homogeneous shade of red according to the kind of stain combination used, in which the bacteria, for the reasons given above, do not force themselves on the vision, while the larger particles of débris, owing to their tint, do not obtrude themselves on the eye. The only objects which stand out in such glaring contrast with this background are the protozoal cysts especially those of *coli* and *histolytica*, plant hairs, and to a less extent the iodine bodies, and a few mould spores.

I wish here to emphasise the need for employing the strong solution of iodine above mentioned in the stain combination. Even in preparations made with iodine alone, this will be found to be a great improvement on the ordinary Gram strength iodine, as nuclear and other details are much more strongly brought out.

The tint of the background varies according to the stain combination used. Rubin S necessarily gives the deepest red, eosin is deep with rather more yellow in it, while the Stephens's scarlet writing fluid is similar to the eosin but less

[1] THE LANCET, 1916, ii., 1100.

intense and a more marked yellowish-red. To get the best colour contrast between background and cyst wall it is a matter of great importance to take into consideration the source of illumination used. Much the best contrast is got by using the rubin S combination stain with daylight as the source of illumination. Failing this, white artificial light, and failing this, a deep blue screen must be inserted below the diaphragm in the case of the eosin and the ink combination stains respectively, in order to cut off the yellow rays.

With ordinary strong daylight the rubin S combination gives a rose-red tint to the background, while with either of the other combinations the background is a sort of salmon-pink. From all, the cysts stand out a brilliant greenish-yellow, although the contrast is not so marked the yellower the background becomes. The best contrast effect can, however, soon be determined after a little manipulation by each individual worker for himself, who must bear in mind the points mentioned above regarding depth of film, and so on.

I wish in conclusion to express my thanks to Mr. R. C. M'Lean, M.A., B.Sc., of University College, Reading, for much valuable help in connexion with the above.

Summary.

The stain combinations here recommended are devised for the purpose of detecting protozoal cysts in general and more particularly those of *E. coli* and *E. histolytica*, but they are not intended as a means of discriminating between *coli* and *histolytica* cysts respectively, although there are some indications that this mode of staining may aid in the differentiation. To get the best results attention must be paid to the various points mentioned. The advantages claimed for the above technique are these:—

1. One or other of the stain combinations can easily be obtained and rapidly made up.
2. The detection of cysts and their identification are carried out in one and the same preparation.
3. The contrast in colour is so striking that the cysts cannot be mistaken for anything else and the veriest tyro cannot fail to detect them if present. The possibility of missing a carrier is reduced to a minimum.
4. Without using too thick a preparation, it is nevertheless possible to use slightly more fæces at one examination than by the simple iodine method. The cysts can be picked out quite easily even in a thick clump of débris, and this is not always possible in a simple iodine preparation.
5. Where doubt exists as to whether a particular cyst is to be classified as *coli* or *histolytica*, accurate measurement—formerly considered a point of crucial importance but no longer to be relied on—is facilitated, since the effect of halation is practically eliminated.
6. The method above described reduces considerably the time spent on such examinations, a point of some importance where many specimens have to be examined in a day. A positive film even in the hands of the less experienced can be recognised at once, while a negative film may be labelled so with certainty inside two minutes.
7. Where the observer is hunting specially for the smaller cysts, such as those of *Tetramitus mesnili*, the Stephens's ink combination may be found preferable, although it does not give such a definite colour contrast with the larger cysts. In all cases the film made should be the thinnest possible, and the source of illumination should be taken into account.[2]

[2] Since writing the above the Director of the Wellcome Research Bureau has kindly given me a reference to a wet-stain method described by Kuenen in a paper, "Sur la Dysentérie Amœbienne," published at Saigon in 1913. In this paper the stain used was a single one, either eosin, methyl-blue, or iodine by itself. Eosin alone, as recommended in this paper, is poor, and not even as good as iodine alone.

Reading.

ROYAL VICTORIA HOSPITAL, BELFAST.—At the annual meeting, held on March 29th, it was reported that during 1916 there had been 3487 intern and 28,413 extern patients, a daily average of 518 patients, in the hospital, and that over 2200 operations had been performed. Though the annual subscriptions have increased, it is estimated that an additional sum of £5000 will be required during the current year, owing to the continued rise in the cost of materials. Five members of the medical staff are at present at the front. A bequest of £10,000 from the estate of the late Miss Kennedy was announced.

TOXIC SYMPTOMS AFTER THE USE OF BISMUTH PASTE.

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IN view of the increased use of bismuth paste and its great value in the treatment of infected wounds, I venture to publish the result of an investigation into a number of cases suspected of poisoning which have occurred in the surgical wards of the Wharncliffe War Hospital, Sheffield.

Five men have been found to show symptoms suggesting plumbism, and although under the care of different surgeons and in different wards they are alike in suffering from severe septic wounds and in the fact that all were treated by the application of bismuth and iodoform paste (B.I.P.P.) according to Professor Rutherford Morison's technique. This paste has been in use here from September, 1916, and is still being used. The method was very kindly demonstrated to me by Professor Morison in November, and has been proved to be very beneficial.

Up to Nov. 3rd the paste was prepared from bismuth carbonate, which was afterwards tested, and no lead contamination discovered. After Nov. 3rd a new lot of bismuth subnitrate was used, as in Professor Morison's formula; this stock lasted for about four weeks, and it was among the cases treated during this period that those suspected of poisoning occurred. Unfortunately, the subnitrate was used up before the symptoms had been noticed, and the drug was therefore not analysed. Since the beginning of December, both bismuth carbonate and subnitrate have been used, and both have been examined and declared lead-free by Staff-Sergeant F. C. Thompson, D.Sc., R.A.M.C. The method of testing is added to this report as a separate note. The drugs have all been obtained from the base medical stores at York.

In this report seven cases are included, all of which were treated by the Morison method; they represent all the most severely wounded and most septic cases treated with the bismuth paste at that time. Many slighter cases were similarly treated, but none showed poisoning. Of the seven cases, five had symptoms of poisoning, and two were free.

In the accompanying table, which gives details of the cases, it will be seen that four patients developed a *blue line on the gums*. This was first noticed in Private Y., who complained of a sore mouth 10 to 14 days after his operation, and was found to have a broad band of bluish pigmentation inside the cheeks, and on the sides of the tongue, as well as an unusually thick line on the gums. Other patients were then examined and three more were found with less noticeable, but still distinct "blue lines"—Sergeant R., Private B., and Private D.

Anæmia was present in all seven cases, and disappeared as the wounds healed. *Constipation* was especially noticeable in Private Y. Both symptoms are so common among men with severe wounds that they are of little diagnostic value. No neuritis, wrist-drop, colic, or headache has been noticed. *Mental stupor* was a troublesome feature in one patient (Private D.), but had been developing before his treatment with bismuth paste.

Loss of sphincter control, delirium, and sleeplessness continued for two or three weeks in the case of Private J. B., who was extremely ill and thought to be dying. His infection was severe and his knee-joint was involved. Improvement followed, not directly after amputation, but as the suppurating amputation wound cleaned up. His symptoms, therefore, may have been due to plumbism, but are much more likely to have been caused by septic intoxication or iodoform poisoning.

Blood changes were looked for by our pathologist, Major A. E. Naish, R.A.M.C. (T.), but no granules were found in the corpuscles. The *urine* was also examined for lead, but no trace found in any case.

Opinion was, at first, strongly in favour of the view that the symptoms in these patients were due to lead absorption, especially as the cases occurred while one particular batch of bismuth preparation was in use. But in Sir Thomas Oliver's book on "Lead Poisoning," p. 135, it is stated that—

A blue line on the gums, with difficulty distinguished from that caused by lead, may be observed in persons to whom large doses of bismuth have been administered by the mouth; or who, as the subjects of empyema, have had injected into the fistulous track in their thoracic wall bismuth emulsion.

DETAILS OF CASES, INCLUDING THOSE WITH TOXIC SYMPTOMS AFTER USE OF BISMUTH PASTE.

—	Disease.	Date of wound.	Severity and character of wounds.	Date of operation and application of B.I.P.P.	Date of symptoms.	Severity and character of symptoms.
Pte. Y.	G.S.W. both legs. Double amputation in France.	July 7, 1916.	Large granulating flap wounds at level of knees.	Double re-amputation. Dec. 5, 1916.	Dec. 16 onwards.	On Dec. 16, 1916, complained of sore mouth; had broad blue line on gums and cheeks Dec. 22. Constipation; no colic; anæmia. Wounds healed by Dec. 30.
Pte. D.	G.S.W. left thigh. G.S.W. left foot. Comp. fracts. of femur and tarsal bones.	Aug. 6, 1916.	Both wounds severe. Much suppuration. Fractured femur in bad position.	Nov. 17, 1916.	Dec. 20.	Blue line on gums, Dec. 20th. Mental stupor on Dec. 1st, but had been difficult to manage and stuporose to less extent during early part of November. Anæmic all the time. Wounds healed by Jan. 7th, 1917.
Pte. M.	G.S.W. left shoulder. Fract. of greater tuberosity of humerus. Joint involved.	Oct. 25, 1916.	Wound pouring with pus. Temperature 103° every evening.	Nov. 12, 1916.	—	No toxic symptoms. Steady improvement.
Pte. B.	G.S.W. right thigh. Comp. fract. femur. G.S.W. left wrist.	Nov. 10, 1916.	Septic wounds. Femur comminuted.	Nov. 27, 1916.	About Dec. 20.	Well-marked blue line on gums. Anæmic (but was so before operation).
Sgt. R.	G.S.W. right shoulder. Fract. of greater tuberosity of humerus. Joint infected.	Nov. 13, 1916.	Deep wound tracking behind joint, and under scapula. Septic.	Nov. 27, 1916.	About Dec. 20.	Pyorrhœa alveolaris, with thin blue line on gums. Transient anæmia.
Pte. J. B.	(*a*) G.S.W. left buttock. (*b*) G.S.W. left thigh. Comp. fract. femur. Knee-joint infected.	Nov. 16, 1916.	Infected, but well treated by Carrel method. Bone projecting into supra-patellar pouch of knee.	(1) Nov. 27; (2) Dec. 14.	Dec. 4th and later.	No blue line on gums. Delirium; sleeplessness; high temperature; loss of control over sphincters. All these symptoms were considered to be due to septic infection.
Pte. H.	G.S.W. right thigh. Comp. fract. of femur.	Sept. 15, 1916.	Track through thigh from side to side. Septic. Bone comminuted.	Oct. 27, 1916.	Nil.	No toxic symptoms. Progress in this case was much better after the use of the bismuth paste. He had shown practically no improvement previously.

And in our cases, with the exception of the "blue line," no typical symptom of plumbism has been present, although with so intense a blue line as occurred in the patient, Private Y., other symptoms might reasonably be expected to occur. In view of the importance of a correct diagnosis it is very unfortunate that none of the bismuth preparation used in treating these particular cases was obtained for chemical examination.

I desire to acknowledge the help of Major Naish, Mr. M. H. Phillips, and Dr. J. C. Maddison in the investigation and treatment of the cases referred to.

Method used for detecting a trace of lead in bismuth carbonate or subnitrate, by Staff-Sergeant F. C. THOMPSON, D.Sc., R.A.M.C.—The usual tests for lead are useless. When dissolved in nitric acid, lead can be precipitated as PbO_2 on the anode of an electrolytic cell, while bismuth goes to the kathode. The following method, which is simple, very delicate, and requires no special apparatus or skill, has been worked out for the purpose.

Dissolve 5 grammes of the bismuth compound in 10 c.c. of concentrated hydrochloric acid. Dilute until bismuth oxychloride is just precipitated, and re-dissolve in a few drops of HCl. Filter if necessary through a *dry* funnel into a dry beaker. Add 3 c.c. concentrated sulphuric acid, cool and add an equal bulk of alcohol, and put aside. 0·07 per cent. Pb gives a milkiness in about five minutes. 0·02 to 0·03 per cent. Pb gives a faint milkiness in about four hours.

THE

RELATION OF STRUCTURE TO FUNCTION AS SEEN IN A MECHANISM OF THE VENOUS SYSTEM.

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IT is difficult to imagine that the arrangement of the venous system, to which attention is directed in this note, can have escaped the observation of anatomists and physiologists from the time of Harvey onwards. When once the cardinal facts of the circulation of the blood had been demonstrated it is beyond belief that any mechanical aid towards the efficiency of the circulation should have escaped notice. But recorded observations upon this particular detail have not so far been encountered in the literature; and it is to be remembered that a just conception of the mechanism of venous return came relatively late in the story of unravelling the mysteries of the circulation.

That John Hunter had no note upon it, in such of his manuscripts as are lost to us, is difficult to believe. But had the observation ever received common currency it is unlikely it would have escaped the attention of the Rev. William Paley, nor could it have failed to furnish material for a Bridgwater treatise. However, this particular phase of anatomical literature does not dwell upon the detail to which attention is here directed, and this silence is shared by modern text-books on anatomy and physiology. It is this fact which alone justifies publication to-day. That a search of the literature has not revealed an exposition of a simple mechanical contrivance in the animal body is my excuse for publication, but I would apologise in advance to such eighteenth century philosophers as may have appreciated and recorded the conditions in works which I have, so far, overlooked.

The primary tubular elements of the vascular system are primitively pulsatile, and this pulsatile power is manifested at an extraordinarily early period. Not only is the first formed heart-tube capable of contraction and dilatation, but every mesoblastic muscular cell of the primary tube is endowed with an inherent power of rhythmic movement. By this power, aided by a secondary valve system, the blood is urged onwards to distal parts of the body. But when the blood, so urged, has come to the end of the outgoing arterial system and enters upon its meandrine pilgrimage of the tissue spaces it loses, little by little, this propulsive *vis a tergo*. Yet from its tissue wanderings the blood still has to find its way along the veins upon its return journey to the heart.

It is obvious that, under normal circumstances, this journey has to be undertaken in the absence of any effective pulsatile propulsion from the heart. Many mechanical aids may come to the assistance of the returning venous stream. In the first place, since pulsation is so inherent a property of embryonic vascular channels, it might be expected that pulsatile veins should not be unknown; and, as a matter of fact, their existence has long been demonstrated, and the occurrence is highly instructive. In 1851 Professor T. Wharton Jones[1] first noticed pulsation in the veins coursing in the membrane of a bat's wing. On the average the veins contracted 10 times every minute, and these contractions, aided by a system of valves, were seen under the microscope to propel the blood onwards towards the heart. Such a striking phenomenon at once arrested his attention, and formed the subject of a series of communications to the Royal Society. The circumstance also demanded an explanation, and Wharton Jones suggested that such an arrangement was necessary in the bat's wings, since they "on account of their extent are, as regards their circulation, in a considerable degree, though not entirely, beyond the sphere of the heart's influence." This explanation may be partly satisfactory, but it cannot wholly account for the phenomenon. Many structures as far removed from the

[1] Discovery that the Veins of the Bat's Wing (which are furnished with Valves) are Endowed with Rhythmical Contractility, and that the Onward Flow of Blood is Accelerated by Each Contraction. Phil. Trans., Feb. 5th, 1852.

sphere of the heart's influence could be cited, and pulsatile venous channels in these structures would be sought in vain. The peculiarity of the veins of the bat's wing membrane lies in the fact that they course in an outlying part of the body which is totally unprovided with muscles capable of exerting pressure upon them. In the absence of skeletal muscle masses in this very specialised manus the pressure which urges the blood onwards must be furnished by the muscle of the veins themselves, and the primitive pulsatile possibilities of vascular channels is called into being.

That the pressure exerted by surrounding skeletal muscular masses is the chief agent in propelling venous blood along the veins is not to be doubted, and this fact is recognised by every physiologist. It is the purpose of this note to point out that in this method of producing venous return structure is related to function in a very striking manner.

We may make a generalisation, which amounts to the statement of a definite law of animal economy, that (1) *venous channels which run their course in the midst of muscle masses are multiple;* and that (2) *when emerging into intermuscular spaces these plexiform vessels unite to form single channels again.* This might be translated into the terms of anatomical nomenclature by saying that arteries are accompanied by single veins in intermuscular spaces, but are accompanied by irregular and multiple venæ comites when passing in intramuscular planes.

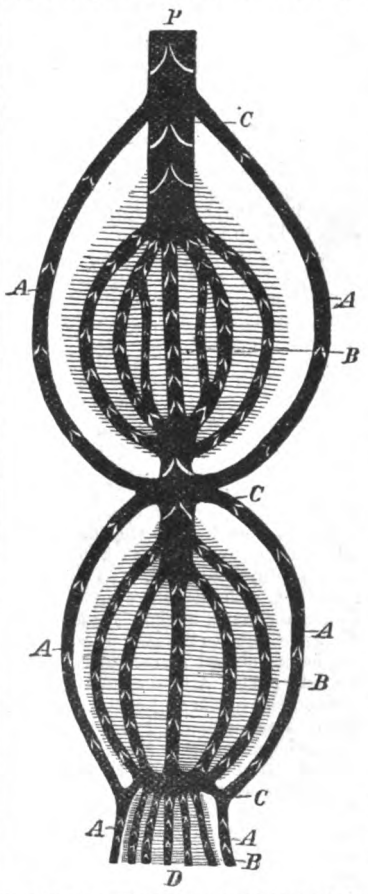
This is a very simple arrangement, but it has led to many complications in anatomical nomenclature. Anatomists rather despise venæ comites, since they are irregular and variable channels, and in many cases these venæ comites are but ill-described and often they are not named harmoniously with the terminology employed for the accompanying artery. The anatomical purist prefers a discrete and constant channel to which to assign a definite name. Instances could be multiplied to weariness, but it will be enough to point to the radial and ulnar veins which have no precise anatomical relation to the like-named arteries, which are themselves accompanied by venæ comites. The radial and ulnar veins are, properly, the complex venous channels which accompany the radial and ulnar arteries in their course among the muscles of the forearm. This question of nomenclature will not be proceeded with further; the purely functional meaning of the arrangement will alone be dealt with.

It is obvious that if blood is to be squeezed back to the heart by the pressure of muscular masses the most efficient mechanical disposition will be achieved by a large series of venous channels containing a large amount of venous blood becoming subjected to pressure whilst lying in the midst of contracting muscle masses. We may say that in the interstices of muscle groups there is a valved venous sponge which is squeezed by the muscles when they undergo contraction. But muscle groups have a definite disposition and spaces exist between the groups—notably at the flexor surfaces of the joints in the limbs—and in these spaces no pressure is exerted. In these spaces the meshwork of venous channels gathers itself together again and forms a single tube, and this tube is invariably equipped with well-developed valves. The sponge is emptied by muscle pressure into this tube and the return of the blood is made impossible by the presence of the valves. In a simple mechanical way the intramuscular venæ comites may be likened to the bulb of a syringe which is compressed by the muscles; the single-valved channel to the valved nozzle of the syringe.

Now, it is to be noted that this arrangement may be several times repeated upon the course of an individual venous channel, the repetition occurring as often as the conditions of subjection to muscular pressure and freedom from this pressure may recur. In the limbs, for instance, there is an intramuscular pressure sponge, or syringe bulb, in each segment, represented by the complex, deeply seated venæ comites of the named arteries. In the flexor intermuscular space over each joint is a single, valved channel or syringe nozzle. The blood is therefore squeezed from stage to stage by the pressure of a series of reservoirs connected up in line, as one might imagine a linked series of Higginson's syringes.

It is at once apparent that such is a highly efficient mechanism when limbs, or parts, are moved in orderly and leisured fashion, segment by segment. But if the whole limb or part be thrown into a state of contraction or if the contraction of the several segments follow one another with great rapidity the several groups of deep intramuscular veins may be compressed simultaneously or in very rapid succession. Such a state of affairs would lead to a blockage of the venous return from the part. In order to meet this demand a second system of superficial veins, which are not subjected to muscle pressure, is called into play. We may make a second generalisation and state that—*at all those points at which the deep intramuscular veins become freed from pressure and appear as single, valved tubes there are connecting, valveless branches between the deep and superficial veins, and at each of these points an alternative course is offered to the blood.*

When the muscles of the next segment nearer the heart are relaxed the blood will return by the deep intramuscular veins, gaining an added impulse by the next contraction of the muscles, but when these muscles are contracted it can pass by the superficial veins to the next discrete channel beyond the contracted muscle mass. It is not necessary to press this matter further, since its simplicity is self evident and a diagram is added to render the details more obvious.



Purely diagrammatic representation of the venous circulation of a limb. *A*, Superficial (subcutaneous) veins. *B*, Veins (in shaded areas) which run in the midst of muscle masses. *C*, Single channels in the interspaces between the muscle masses of different segments. *D*, Distal extremity. *P*, Proximal extremity.

One or two simple outcomes of this arrangement are, however, worthy of notice.

When the muscular system is entirely relaxed, as in sleep, the heart will propel blood to its distal arterial ramifications, but the absence of muscular contractions will impede its return to the heart; venous blood will, therefore, tend to accumulate in the relaxed distal parts. In this way a large proportion of the blood of the body may become lodged in the venous system. Upon waking this blood must be returned to the heart to ensure the proper arterial supply to the brain and other organs. It is for this reason that muscular contractions of the limbs—the familiar stretching — accompany the waking of such animals as sleep lying down in a state of muscular relaxation. Yawning, by causing a suction in the thorax and a compression of the abdomen, attains the same ends. The blood is squeezed home from outlying parts into the cavities of the body, and finally to the heart. It is noteworthy that animals which do not lie down to sleep, or do not thoroughly relax their muscles in sleep, do not stretch or yawn when waking.

One other effect is of peculiarly human interest. If the legs are dependent, but are not engaged in any special muscular activity, venous blood will tend to gravitate into the veins. The deep intramuscular veins are supported by the muscles and cannot overfill, and there will therefore be a tendency for the superficial veins to become distended with blood. This is the etiology of varicose veins in sedentary persons. On the other hand, if the intramuscular veins are vigorously and continuously compressed by muscular action, the burden of returning the venous blood will again be thrown upon the superficial veins. This is the etiology of varicose veins in athletes.

A NOTE ON THE

IMMEDIATE AFTER-TREATMENT OF THE GUILLOTINE AMPUTATION STUMP,

AND THE PREVENTION OF SECONDARY HÆMORRHAGE.

BY H. F. WOOLFENDEN, F.R.C.S. ENG.,
CAPTAIN, R.A.M.C. (T.C.);
AND
J. CAMPBELL, M.D. LIVERP.,
CAPTAIN, R.A.M.C. (S.R.)

THE guillotine amputation stump usually arrives in the base hospital with a not inconsiderable amount of retraction of the skin, more especially after it has been treated for several days without any effort being made to prevent the retraction. Any extension applied to the skin in order to be really effective should commence immediately after operation, be continuous, and result in a more or less complete covering in of the stump. These ends seem to be most satisfactorily attained by the following method, which we have used for a long time in such cases in the hospital with which we are connected.

On the completion of the amputation each of the quadrants of skin is perforated with the knife by a pair of stab incisions about 1 inch apart and 1½ inches from the edge, and a loop of sterilised tape 10 inches long is passed through each pair of perforations (as shown in the diagram) so that the tension is borne by the surface of the skin when the loop is pulled on. The loops of tape are gently pulled down by the assistant and the stump is dressed and firmly bandaged. After this the stump is placed in an ordinary Thomas knee or arm splint and supported in the usual fashion. The loops of tape are then attached to the end of the splint by fairly stout rubber tubing tightened to the required degree and altered from time to time. Any subsequent dressing can readily and easily be accomplished without slackening the extension by merely removing the dressing from between the loops of tape. On the second to the fourth day the tapes are removed and the extension is kept up by strips of crinoline bandage. To the edge of one end of each strip are attached a pair of ordinary metal hooks. These pieces of bandage are glued to the skin by collodion with the hooks placed about 1 or 2 inches from the skin edge. A loop of tape is then passed round the hooks and rubber applied as before. The hooks and collodion are best changed every two or three days. It is most important that the skin should never be allowed to retract when changing the soiled hooks; this can be prevented by an assistant keeping the skin drawn down. The object of the elastic extension is to maintain a continuous pull on the skin as it stretches under the extension.

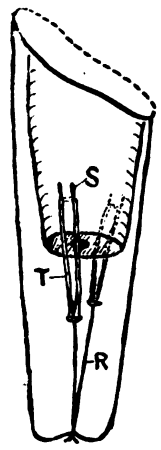


Diagram to show method of applying skin extension to the guillotine amputation stump. S, skin incisions; T, tapes; R, rubber tubing.

By the above means every guillotine amputation can be easily transported, nearly every stump almost completely covered in when discharged to England (more especially if short flaps of ¾ inch to 1 inch have been made at the time of the operation), the stay of the patient in hospital considerably diminished, and the necessity of subsequently shortening the stump obviated, or at any rate the amount of bone requiring removal much lessened. In addition the stump is considerably steadied, with consequent greater comfort to the patient.

It is our invariable practice to *raise the head* of the bed, so that the amputation stump looks slightly downwards. By this means tracking of sepsis along the fascial planes, so frequently seen when the stump is raised, becomes of quite rare occurrence. The pain of subsequent dressings is largely obviated by spreading out a single layer of gauze over the raw surface of the stump, and then packing the dressings on its surface, or by the use of gauze soaked in glycerine.

The writing of this note has been suggested during the last few weeks by the arrival in hospital of quite a large number of guillotine amputations in which no effort at all has been made to prevent skin retraction. No originality is claimed, as extension in some form to the flaps has been used in France for some time; but this method has the advantage that the extension can be maintained during transit by train or boat.

Secondary Hæmorrhage from the Main Artery in Amputation Stumps.

During the treatment of very many amputations which have been done in casualty clearing stations and in this hospital there is one slight modification of the orthodox method that has suggested itself to us. The cut artery in many instances is found to have retracted about ½ inch above the level of the cut muscles. The pocket so left becomes the seat of suppuration and the source of infection, which extends some distance upwards along the outside of the artery. This localised suppuration persists for some time after the rest of the stump has become healthy, and is a very common cause of secondary hæmorrhage from the main artery. Moreover, when such hæmorrhage occurs the difficulty of re-ligaturing the artery is increased on account of its retraction.

What happens is, we think, the following. The fleshy part of the limb is cut through by one sweep of the knife. Owing to its elasticity the artery retracts. It is then seized by the forceps, pulled down, the tissues round it cleared, and the artery tied and let go. It retracts a little further and the opened-up fascial plane becomes the seat of suppuration round the end of the artery. To obviate this we have made a practice of exposing the artery about 1½ inches below the level at which we intend to divide the muscles. We then divide and tie the artery and vein at this level, so that when the amputation is completed the vessels are projecting out from the stump. By this means the incidence of secondary hæmorrhage from the main vessels has, we think, been very much lowered, and in the few cases in which it has occurred it has been very much more easily dealt with, as the end of the artery can be readily re-ligatured without the necessity of further incision.

The occurrence of secondary hæmorrhage in wounds generally.—Another very fertile source of secondary hæmorrhage is the leaving of a stiff rubber tube in contact with a large arterial trunk after the operation of draining a wound, with the almost certain result that ulceration of the vessel occurs, followed by fatal hæmorrhage in many cases. It would at first sight seem unnecessary to point this out, but we can recollect very many patients coming down from the casualty clearing stations with large rubber tubes pressing against their femoral or brachial arteries. These have always been immediately removed, but only too frequently the damage has already been done, and within a few days dangerous and often fatal hæmorrhage takes place from the eroded artery.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

Traumatic and Arterio-venous Aneurysms.

A MEETING of this society was held on April 2nd, Lieutenant-Colonel D'ARCY POWER, the President, being in the chair.

Colonel CHARTERS J. SYMONDS, who opened the discussion, said that whilst many cases of arterio-venous aneurysm had been submitted to operation since the war began, others had remained untreated; it would be very valuable to see both groups and so modify the views currently held. His experiences had led him to correct some of his former views. The most interesting form of aneurysm was that in which there was a communication between an artery and a vein, either direct or by the intervention of a sac. In some the communication was set up within a few hours of the trauma; in others there was considerable delay. He asked for experiences as to the secondary effects of aneurysm, such as were alluded to by Sir George Makins and by Dr. Bernheim, of America, especially cardiac and circulatory disabilities. The local condition in some varix aneurysms was important; in those involving the common femoral artery and the profunda femoris there was enormous dilatation of veins, so that they looked like sinuses running through the

muscles. The difficulty in arresting hæmorrhage in these was very great. After giving particulars of a number of these he proceeded to discuss the treatment. In aneurysm of the posterior tibial artery the disability was very slight; this was also true for those at the bend of the elbow. When an aneurysm existed at the base of the skull, so that the patient was kept awake at night and had nerve disturbance in consequence, it was advisable to operate. Sir George Makins's view was that aneurysmal varices seldom required operation. He described by means of diagrams the various operative procedures which had been devised for aneurysm and the degree of success which had attended them in his own experience. Gangrene was a serious danger in operations on the common femoral; in the South African War it occurred in 50 per cent. according to Makins. In aneurysms below the middle of Hunter's canal his experience was that gangrene did not follow ligature of the vessels. With regard to arterio-venous aneurysms Sir George Makins was strongly of opinion that these should be left for from two to three months to consolidate and contract and to permit the establishment of a collateral circulation. But the speaker suggested that it might be wiser to operate on them early, in the same way as upon a wounded artery, thus avoiding the trouble due to adhesions which followed passive waiting. Procedures which might be useful were temporary ligature of a large artery through the abdomen or compression of the common iliac artery by a band of deep fascia being sewn over it or using a portion of saphena vein sufficient to encourage early collateral circulation. In aneurysm of the carotid there was danger of the supervention of hemiplegia, one or two examples of which he related. He thought that much could be said in favour of operating earlier than Sir George Makins advocated. The formation of adhesions and the development of a large number of thin-walled vessels, which were particularly hampering if the operation indicated was suture of the aperture in the artery, had to be taken into account.

Major R. H. JOCELYN SWAN spoke of the need for distinguishing between arterial hæmatoma and arterio-venous aneurysm. By the former was meant a collection of fluid blood and clot contained under pressure in the muscular and fascial planes of the limb into which blood is forced from a laceration in the wall or complete severance of an artery or a large branch of it. The clot might become softened by direct infection from the external wound, when secondary hæmorrhage might occur, or, as was more common, the surface wound healed, whilst the impact of the circulating blood hollowed out a cavity in the recent clot, which by organising formed a more or less thick-walled laminated sac with smooth inner lining, resulting in a pulsating swelling and forming the false or traumatic aneurysm. At the same time, as the result of infiltration of the tissues by serum and leucocytes, a good deal of matting and fixation of the sac occurred and the anatomical lines were obscured, conditions which caused difficulty when an attempt was made to remove the sac at an operation and might render the main vessel hard to find at some distance from the aneurysm. An arterio-venous aneurysm implied a wound both of the artery and vein, with a communication between them. This might be direct—aneurysmal varix. This simple form was uncommon; it was more common to find an aneurysmal sac at the distal side of the artery in addition or a sac lying between or on a side of both artery and vein, with which both communicated. In some cases the sac seemed to be formed mainly from the venous injury. An arterio-venous aneurysm might not be noticed for some weeks or months after the injury. Of the recently published cases of aneurysm following gunshot injuries, of 146 which were operated upon, 106 were false aneurysms and 40 of the arterio-venous variety. In his own 23 cases 16 were false and 7 arterio-venous. With regard to situation, 40 occurred in the upper extremity and 90 in the lower, 12 of the remainder being in the carotids. The proportion of arterio-venous to false aneurysms was greater in the larger vessels; in the femoral it was 14 to 31, in the popliteal 8 to 21, in the posterior tibial 2 to 13, whilst in the axillary it was 3 to 9 and in the brachial 2 to 14. In the neck there were 8 arterio-venous aneurysms to 4 traumatic. The physical signs of arterio-venous aneurysm differed from those of false aneurysm. The bruit, which might be systolic at first, became a more continuous rumble, and was conducted more widely both along vessels and bones. The thrill was coarser and bubbling and often appreciated by the patient. The swelling of a varicose aneurysm was usually smaller and less defined than that of a false aneurysm. Dealing with treatment, he advised delaying operative procedure for some weeks unless untoward symptoms, such as gangrene, rapid increase in the size of the swelling, or increasing pain from pressure upon nerves, should force one's hands. In most cases of arterial hæmatoma he advised complete rest in the hope that the whole might consolidate, whereas if a traumatic aneurysm developed it could be dealt with subsequently. If an arterial hæmatoma were opened it might be very difficult to pick up the injured vessel, whereas a proximal ligature of the main trunk at the seat of election was to be avoided, for not only had the collateral circulation been given little chance of establishing itself, but also it might be seriously interfered with by the pressure of the mass of blood-clot in the tissues. Further, the hæmorrhage might proceed from a large branch and not from the main trunk, while ligature of the main vessel might determine the onset of gangrene in the limb. When a false aneurysm was present the patient should be kept at rest with slight pressure on the swelling and the latter carefully watched for any increase in size. Although operative treatment would generally be necessary, it should be deferred, if possible, until all wounds were firmly healed and collateral circulation had had a good chance of becoming established. The difficulties were lessened rather than increased by waiting. If the swelling had not appreciably diminished in 6 to 8 weeks, if signs of increase were present, or if pain from nerve pressure became marked, operation should be undertaken. In most of his operations he had been obliged to abandon an attempt at suture and to rely upon obliteration of the vessel by ligature. The operation should aim at reconstructing the lumen of the injured vessel by suture; when this was not feasible, ligature immediately above and below the injury should be carried out and the sac emptied and obliterated by suture. It was neither advisable nor necessary to attempt removal of a large sac. By opening the sac one made certain that no branch led into it which would keep up the aneurysm. In arterio-venous aneurysm operation would seldom be required for direct fistula. When the artery and vein were in communication through a sac, operation was needed, owing to the gradual increase in size of the swelling. He believed that ligature of both the artery and the vein, above and below the aneurysm, would be found to be the best that could be done where immediate suture was impracticable.

Major W. MCADAM ECCLES remarked that Colonel Symonds thought it would be well not to wait before operating on arterio-venous aneurysm and ordinary traumatic aneurysm, whilst Major Jocelyn Swan thought it wise to wait. He believed that both were right. In the case of aneurysm in the neck he considered that the sooner one operated the better; but when the situation was one of the limbs, it was right to wait for collateral circulation to be established. So far he had not had a case of gangrene of the lower limbs, because he had waited for months in these cases.

Captain J. R. LEE, of the Australian Forces, expressed his firm belief in combining the operative treatment with the administration of a vaccine to counteract the lighting up subsequently of pathogenic organisms. Where it was possible, preference should be given to an autogenous vaccine. He agreed as to the wisdom of waiting in cases of aneurysm of the limbs. He did not agree with leaving the sac, as there was evidence that it was apt to become canalised.

Captain C. ROWNTREE considered that aneurysmal varix with a direct arterio-venous fistula was, on the whole, better left alone, especially as it caused but little trouble. It was a different case with the indirect variety. Suture was very rarely possible, though it should be aimed at. It would be useful to learn the proportion of cases of successful suture. One could not always be certain whether a condition was aneurysmal varix or varicose aneurysm, and in some cases it was essential to incise and explore before deciding whether it should be left alone or operated upon.

Dr. MILLER thought, as the result of watching many cases, that when an aneurysm was near nerve trunks, if the surgeon was willing to operate, he should do so at once. With regard to tying the common carotid, he believed that hemiplegia occurred only when embolic material found its way into the brain.

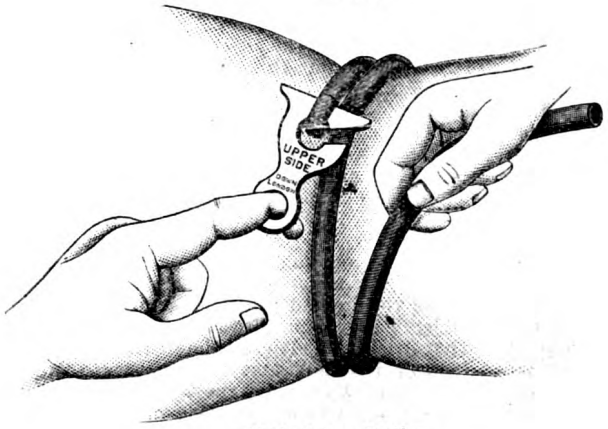
Colonel SYMONDS and Major SWAN replied.

New Inventions.

A NEW TOURNIQUET.

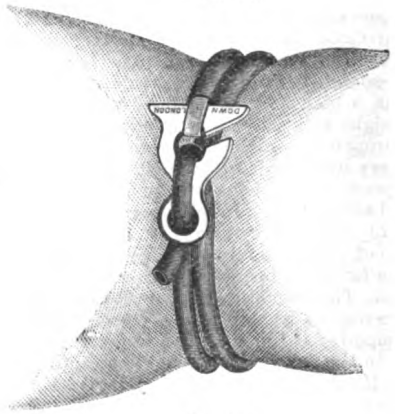
THE question of tourniquets, both in war surgery and in operations on the extremities, has been rather prominent recently, and some correspondents to THE LANCET have advocated the use of pneumatic tourniquets. It is obvious, however, that these are not suitable either for the arrest of severe hæmorrhage or the compression of a large artery such as the femoral, though they may be satisfactory for the compression of veins to facilitate the intravenous administration of drugs, such as salvarsan and its substitutes. What is required in the design of a tourniquet is simplicity of application, strength, and security. The fastening which is here depicted has all these merits. It consists essentially of a shaped metal plate (see illustrations) with a wide base and two circular openings. One of these is complete, whilst the other is split so that the rubber tubing which supplies the elastic compressing force can be slipped into it.

FIG. 1.



Method of application.

FIG. 2.



Applied.

The method of application is as follows:—

The left forefinger should be hooked through the complete ring (Fig. 1) and the plate held on the upper aspect of the limb, whilst the first turn of the tourniquet is passed round and under the limb and beneath the metal plate. The base of this is then pressed down on the rubber so that it is held secure, while the right hand is again passed beneath the limb to apply the second turn of the tourniquet with sufficient pressure to obliterate the arterial circulation. When the circular outline of the tubing becomes flattened by forcible stretching it can easily be slipped through the lateral slot in the proximal opening, the size of which is calculated to prevent the escape of the tube. Any subsequent slipping of the tourniquet is then guarded against by threading the tubing through the complete ring (Fig. 2) and pulling it tight. Two turns of the rubber tubing are sufficient for the lower extremity, and in the case of the arm the necessary compression can easily be obtained with a single turn. It is, of course, necessary to protect the skin of the limb in the usual way with a fold of lint or other soft material.

I have used this new tourniquet in a number of cases with complete satisfaction, and the necessary manœuvres to apply it take longer to describe than to carry out. I have been agreeably surprised to find that an inexperienced dresser can apply it successfully when no instructions at all have been given to him.

Three points should be especially noted:—(1) The complete ring is for the forefinger of the left hand, where it should remain till the tourniquet is in position; (2) by pressing the widened base on to the first turn of the tube around the limb all loss of tension is avoided; and (3) the slot of the incomplete ring should be directed towards the right hand of the surgeon, and to ensure this one aspect of the metal plate bears the words "upper side."

I am much indebted to Messrs. Down Brothers, St. Thomas's-street, London, S.E., for the care with which they have carried out my design.

JOSEPH E. ADAMS, M.S. Lond., F.R.C.S. Eng.,
Devonshire-place, W. Captain, R.A.M.C. (T.)

A SPLINT FOR THE WRIST-DROP OF RADIAL NERVE PARALYSIS.

THIS splint, a description of which is supplied by Mr. Bryden Glendining, F.R.C.S., was originally extemporised by a member of the firm of Henry A. Murton, Ltd., surgical instrument manufacturers, of Newcastle-on-Tyne, who was serving in the Army and was invalided from the front. He became a patient in the Duchess of Bedford's Woburn Military Hospital, and designed the appliance to meet his own case. The splint is made of aluminium, and consists of wrist portion (Fig. 1), moulded and shaped to adapt itself to the volar surface of the wrist and lower ends of the radius and ulna, and attached by a webbing strap and buckle; and palmar portion (Fig. 2), which is shaped and cut out for the hand, and at the same time is capable of extension, whereby it can be lengthened or shortened according to the size of the hand, or according as it is desired to carry the support to the metacarpo-phalangeal joint only, or to the first inter-phalangeal joint, a fly-nut in the splint locking the sliding surfaces and fixing the apparatus at the required length. Between the wrist and palmar sections the splint is hinged and fitted with two strong wire springs, which act in the direction of dorsal flexion, so that, unless counteracted by action on the part of the wrist and hand flexors, the position assumed is constantly that of hyperextension. The support is not carried beyond the first inter-phalangeal joint, since it is considered more beneficial for patients to exercise the fingers by means of the lumbrical muscles attached to the back of the extensor tendons over the first phalanges.

FIG. 1.

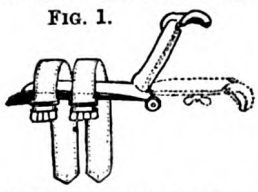
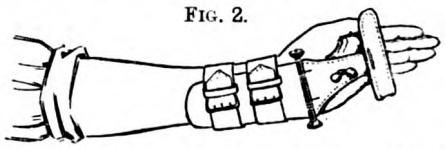


FIG. 2.



The advantages claimed for this splint are its small bulk and lightness, and the increased pleasure which patients derive from being able to use the arm and hand during convalescence. It has been generally adopted at the Woburn Military Hospital.

THE LANCET.

LONDON: SATURDAY, APRIL 14, 1917.

The Health of the People.

SOME 90 years ago the social and economic conditions in England, grievously affected by the Napoleonic wars, produced a feeling among many of the more far-seeing, who were also blessed with a humanitarian sense, that the health of the people ought to be a national care. Even though that feeling took outward form mainly in designing methods whereby the ills of the poor, as far as they were the outcome of disease, should not spread to the population at large, there existed behind it a consciousness that eradication of those ills, rather than a lopping of their branches and a topping of their shoots, ought to be effected. In short, the need for making the health of the people the care of the State had become obvious to those who could read with a sympathetic heart the signs of the times; and from this position to that of to-day, when by common accord we welcome the foundation of a State Department of National Health, seems but a short step—certainly one that should not have required 90 years of consideration. But to come to this conclusion is to forget that only a few people grasped the signification of the conditions in which a large proportion of the population were struggling; that the removal of those conditions was in most cases beset with the difficulties everlastingly associated with established custom and vested interests; and that the science of medicine had not acquired a familiarity with the etiology of disease that could enable its professors to preach the doctrine of prevention with sufficient authority either to arouse the public conscience or reinforce the voice of reform.

The Poor-law Commissioners of 1834 perceived that ill-health was a principal source of pauperism, and that the removal of the causes of ill-health ought to be a more economical proceeding than the treatment of its consequences, and early public health legislation contained the germ of a National Health Department; but the nation—its units no more than its rulers—did not appreciate the splendour of the work which was beginning, resenting only the manifest drawbacks to legislation conceived, with however sensible an object, in the wrong spirit. None the less the work went on, for men were growing more liberal-minded; and as medicine, leaping forward in bounds to accurate knowledge, became first an official aid and then an inspiriting counsel to further effort, sections of the community became alive to the fact that in various directions they could be relieved of masses of evil, to whose pressure they had hitherto resigned themselves. They learned that by sanitation there could be removed barriers to their health and happiness, which remained erect with no better apology than could be found in their antiquity; and, as each section was aroused, it made its claim for relief heard, with the result that the remedy best fitting the circumstances was applied. Schemes of reform initiated in this haphazard manner were entrusted for their carrying out to various departments of Government and various local authorities, with a consequent overlapping of jurisdictions and waste of energy and money, while the resulting confusion has been worse confounded by the creation of new Government bureaux and the rearrangement of local administrative machinery. The outcome has been to make the care of the health of the people, as conducted in this country, a magnificent and illogical muddle, in which fine ideas and accomplishments, many of which elicit the envy of modern civilisation, are blended with the opportunities for extravagance and dissipation of strength inevitably associated with the want of a central plan. All this has been for many years perfectly obvious to the medical profession, as well as to men and women whose public life has brought them into contact with the truths of our social existence. With them the feeling has been implicit that the health of the people, being a national asset, should have the national supervision of a State department. And now the whole nation, under the stress of war, sees eye to eye with them.

The Unionist Social Reform Committee has, therefore, put forward at a very apposite moment a well-written pamphlet[1] on the subject of the health of the people, which unravels in clear terms the intricacies of the position. The writers, deliberately leaning to the economic side of their arguments for a thorough reorganisation of our care of the health of the people, demonstrate with figures the appalling loss in man-power suffered by a nation which takes no heed to the health of its members. This loss they translate coldly into terms of money, mentioning sums that even in these times, while our ears learn of millions being spent daily in the conduct of the war, are so enormous as to challenge the attention of all. And, incidentally, it may be of considerable value to future progress that the popular mind should have been familiarised with the necessity of paying colossal sums to achieve worthy ends; poor we all shall be after the war, but we shall have learnt the lesson that great efforts are worthy of great sacrifices, and shall be ready to start a campaign against disease with the open-handedness which has marked our military procedure, and, let us hope, with less grounds for the reproach of waste and disorder. A State Department of National Health is imminent, and, from the details so far made public, it seems safe to assume that in the new bureau full recognition will be accorded to the work and claims of private practice. Whatever prevention may do for the health of the people in bulk, the sick will have to be treated in detail; and it will be excellent that those practitioners who have to make good the places

[1] The Health of the People: A New National Policy. A Report of the Unionist Social Reform Committee. London: Argus Printing Company, E.C. 4. 1917. Price 3d.

where the defences have broken down, or to confirm on their patients the outcome of scientific investigation, should possess the same central authority as those carrying out the work of prevention or research. In this way there will be a community of interests between the official and the private doctor from which the public will benefit.

"Soldier's Heart."

THE articles which have recently appeared in our columns, as well as the letters published in this issue, bear witness to the interest taken in the subject of "disordered action of the heart" in soldiers. The Medical Research Committee has now published a report by Dr. THOMAS LEWIS of the investigations made by himself and his colleagues at the Mount Vernon Hospital, Hampstead, which the Committee has lent to the Army Council for the purpose. No name yet suggested for the condition is quite satisfactory. A considerable number of cases returned originally as valvular disease of the heart have been included in this report, as further examination showed that they did not present convincing evidence of organic disease, and therefore came within the scope of the inquiry. As the condition is not unknown among civilians, the term "soldier's heart" is not really applicable, and as there is no proof that it is primarily cardiac any such name as "disordered action of the heart" is neither accurate nor advisable. For the impression that he is suffering from disease of the heart retards the patient's recovery. Dr. LEWIS prefers the non-committal term of "effort syndrome," though this label probably will not gain general acceptation. He considers the leading symptoms, in order of importance, to be breathlessness, præcordial pain on exertion, exhaustion, giddiness, and fainting. He notes, as of less importance, palpitation, headache, lassitude, irritability of temper, insomnia, shakiness, and flushing. A disinclination to take alcohol in any form (sometimes for conscientious reasons, but as commonly for reasons of distaste) is to be reckoned a frequent and remarkable association. The characteristic signs on examination he classifies as follows: Increased heart-rate, with an exaggerated response to emotion, exercise, and posture. The response of the systolic blood pressure is similarly exaggerated, and in patients who are up and about high readings are often obtained. A diffuse apex beat and irregularity of the heart's action, increased by deep respiration, are not uncommon. Fleeting disturbances of temperature may be observed, and quickened respiration is the rule after exertion, but may also occur in the resting state. Coldness, blueness, or wetness of the palms and soles is frequent. Tremor of the hands is the rule. Deep reflexes are usually exaggerated. The urine is hyperacid and the output of calcium is increased, chiefly in the form of calcium oxalate crystals. Spermatozoa are very common in the urine. There is an increase of white corpuscles in the blood to 12,000 per c.mm. on the average, the increase being chiefly in the lymphocytes. The alteration of the blood lies in the deficiency of those salts, which, acting as buffers, ease the shock to the reaction caused by the addition of acids or alkali. In their absence the acids evolved by muscular exercise tend to irritate the respiratory centres.

In dealing with the cases at the Mount Vernon Hospital a preliminary sorting eliminated the cases of early phthisis, frank exophthalmic goitre mitral stenosis, aortic regurgitation, and aneurysm. In Dr. LEWIS'S opinion the great majority of those patients who have merely systolic murmurs at apex or base prove not to have valvular disease. He regards auscultation as the least valuable method employed in this sorting. As to this, Dr. ALEXANDER MORISON'S protest against the modern contempt for cardiac murmurs demands consideration; if it is true that not long ago we exaggerated the significance of murmurs, that is not to say that nothing is to be learnt from their detection. A second sorting of the cases was then carried out by more detailed inquiry and by the response to graduated exercises. Where the symptoms dated from rheumatic fever or there had been recurrent rheumatism the men were not regarded as suffering from effort syndrome. Dealing with the remainder, Dr. LEWIS reports that malingering in the sense of simulation of the full symptoms of the malady is very rare, but conscious exaggeration of symptoms is almost certainly common. Of 93 patients, only 2 wished to return to active service, 41 wished for home service, and 50 for discharge from the Army. No doubt this mental attitude influences recovery. A valuable point that has been determined is the high incidence of the condition among men who were formerly in sedentary occupation. There is real necessity for more tender methods in the initial stages of training the conscript who for years has been accustomed to take no exercise. The frequency with which the symptoms develop during convalescence from febrile and intestinal affections suggests the desirability of a graduated system of re-training in such cases, while rest in bed, Dr. LEWIS holds, should be avoided at all stages of treatment, except in instances of severe præcordial pain, severe headache, or severe giddiness. It is quite obvious why the inclination of many of these soldiers to stay in bed should be discouraged; a high proportion of them are of neurotic temperament, and self-abuse is by no means unknown among them. Occupation is clearly indicated, and light employment in the open air with graduated exercises and general hygienic measures are the best therapeutic means we have. No suggestion should be made that the heart is affected. As to drugs, bromides may be of service in the initial stages, but later they are of no avail. Digitalis is without influence in these cases, and the report suggests, therefore, that its use should be discarded; the only soldiers in whom it has a real value are unfit to remain in the Army. On the lines of treatment here described it is claimed that the duration of the incapacity is considerably reduced. The average duration of stay at the hospital is now, we understand, six weeks.

As to the cause of the condition, Dr. LEWIS'S conclusions are mainly negative. That it is particularly apt to occur in men who have lived a sedentary life and have had some form of infection he is clear; he is satisfied that tobacco is not responsible for producing it, but is also sure that it aggravates the condition, once it has been produced. Alcohol is certainly not a cause. He rejects the theories of bacteræmia, toxæmia, and hyperthyroidism. On the other hand, Dr. STRICKLAND GOODALL in a recent Chadwick Lecture considered the nervous and irritable heart to be due to a compensatory hyperthyroidism, initiated by excessive emotional stimulation of the suprarenals, and a somewhat similar view was put forward recently by Dr. LANGDON BROWN in the Hunterian Society's Oration.[1] Dr. LEWIS admits that the patients show nervous symptoms, but to a less extent than those commonly classed as neurasthenics. He concludes that "it is conceivable that the symptoms arise not from poisoning by toxic products but by products of faulty metabolism engendered by infectious disease. The same fault of metabolism might reasonably be considered to arise from chronic infections of different types." He regards the changes in the blood and urine as strongly supporting this view. We would suggest that this faulty metabolism may yet be found to be associated with one of the ductless glands, even though the thyroid may not be that one. In the course of the research at the Mount Vernon Hospital Dr. F. R. FRASER and Dr. R. MCN. WILSON have found from their observations upon apocodeine and adrenalin that the sympathetic nervous system is more easily stimulated and also more easily depressed, but whether this is due to hypersecretion of the adrenal glands has not been determined. In this connexion the effect of acute infections in exhausting the chromaffin material in the adrenals is certainly suggestive.

[1] THE LANCET, Feb 24th, 1917, p. 293.

THE LATE MR. LEONARD GEORGE BOOR.—There died recently at Nelson, N.Z., in his ninety-second year, Mr. L. G. Boor, who was educated at Christ's Hospital, London, and received his medical training at Westminster Hospital, where he was house surgeon in 1851. In the following year he took the M.R.C.S. Eng., and practised in London till 1854, when, his health failing, he went to New Zealand, and, after a short experience of farming, accepted in 1870 the appointment of surgeon to the Nelson Hospital and Asylum, which he held for 27 years. Mr. Boor was an enthusiastic supporter of the Volunteer movement, and was a brigade-surgeon in the New Zealand Defence Force, taking part in 1881 in the Parihaka Expedition against the Maoris, and receiving in the following year the Imperial Volunteers Decoration. He was a prominent Freemason.

THE CANCER HOSPITAL.—At the recent annual meeting Colonel J. W. Webber, who presided, said that at the beginning of the war accommodation was placed at the service of the War Office and many soldiers had been treated by massage and electrical means and their return to service facilitated. In the research department important investigations had been carried out. During 1916 798 new cases were admitted to the wards, an increase of 20 on the preceding year, while new out-patients numbered 1519 as compared with 1424 in 1915. The total attendances of out-patients had increased from 16,154 to 23,922, and the daily average number of beds occupied was 90, or an increase of six on the preceding year. The financial statement showed a deficit of £9165 on the working expenses. Mr. Charles Ryall, chairman of the medical committee, said he thought that no hospital had suffered more by the depletion of its honorary medical staff than the Cancer Hospital.

Annotations.

"Ne quid nimis."

CHILD MORTALITY.

IN a supplement to the forty-fifth annual report of the Local Government Board Sir Arthur Newsholme, medical officer of the Board, has analysed the causation of deaths occurring in England and Wales during infancy and in the next four years of life. The statistics relied upon are those of the years 1911–1914, practically the four years immediately preceding the war. He cites the shuddering figures of infantile mortality in some of our crowded centres, and proves by their contrasts offered in other centres, as well as in rural areas, that increased organised endeavour would save for the country a large proportion of the sacrificed babes, as well as preclude the deterioration of those who emerge alive from their first year's experience of the world. In common with the report of the Unionist Social Reform Committee, he does not disguise the part played in the slaughter of the innocents by lamentable housing conditions, but without laying undue stress upon this matter alone: a reticence that has its wise side, for many men and women, anxious to play their part in helping their fellows, have been driven into the inert watching of much infant suffering by the belief that it was all due to bad housing, and that bad housing could not be bettered. This is a mode of thought that requires correction. Even in the most backward of the towns and boroughs mentioned in Sir Arthur Newsholme's black-list much saving of child-life has already been secured. The component factors producing excessive loss of child-life vary greatly in different areas, but in every area a large proportion of the total present mortality may be obviated by enlightened administrative action. Sir Arthur Newsholme does not consider the ignorance of the working-class mother to be greater than that of mothers in other classes of society, but her ignorance is more dangerous because associated with relative social helplessness. How the environment of the poor child, in its widest sense, may be levelled up towards that of the well-to-do infant is the main and closely reasoned subject of the report. With this levelling up the economic obstacles to improving the housing of the poor will disappear because the greater economy of saving lives and preventing disease will become apparent. When communities appreciate that to cure disease or to palliate its sequelæ costs in the long run infinitely more than to prevent disease in children; and when the country holds, as we believe it holds already, that the preservation of the health of the child is the duty of the people, and therefore of the State, there will be little reluctance to finding the necessary money. Let the good that has followed in a few localities upon thorough attempts to deal with the housing question, in places like Port Sunlight and Bourneville, be seen by the citizens of other localities in its real proportion, and the victory of reform will be won. All that is necessary is that the community should know on which side true economy lies, and one of the most useful functions of this report is the dissemination of accurate information, free of party spirit and authoritative in tone.

THE NATURE AND FUNCTION OF EOSINOPHILE CELLS.

THE study of eosinophilia has always been of interest to hæmatologists, and excess of it in the blood is met with in many and various morbid conditions, and gives rise to as many interpretations. The origin of eosinophile cells is equally disputable; do they represent an entity special to themselves, or are they ordinary neutrophiles which in certain contingencies, and for reasons connected with biological and pathological factors, are able to assume the character of eosinophiles? Some light is thrown on such questions by Professor R. Marchesini, of the University of Rome (*Il Policlinico*, Medical Section, Jan. 1st, 1917), who has made a study of the presence of eosinophiles in the blood and in pathological tissues, besides carrying out experiments in animals. He found that the simple fact of repeated bleedings for a long period was sufficient to produce in the bone marrow a large excess of eosinophiles, while, on the other hand, substances introduced under the skin caused evident phagocytosis but absence of eosinophilia. Thus he considers the question of the origin of eosinophile cells from the bone marrow, as true individualised cells required for special functions, to be definitely solved, and, as a consequence, that the eosinophile granules themselves are a product elaborated from the cell or its nucleus destined for functions of special nutrition or repair. The multiplicity of pathological instances in which eosinophilia is met with is evidence that it is not bound up with any given pathological process, but rather that it constitutes a special and unique reaction of the organism both in cause and effect. Eosinophilia is always present in tuberculosis, this being a disease which causes lesions in the tissues, but it sometimes seems to disappear from the circulation whenever owing to the onset of destruction of the tissues, and hence rupture and greater permeability of the vessels, the accumulation of the eosinophiles at the damaged site is facilitated. Moreover, in the most severe forms of tuberculosis their production becomes exhausted owing to the toxic and cachectic state of the whole organism and with it of the bone marrow. In benign cases of tuberculosis, where the foci remain shut off through necrosis of the vessels leading to the tubercle, the localisation of eosinophiles is rendered difficult; but if the stimulus continues, the cells requisitioned from the bone marrow remain in the circulation in readiness to penetrate wherever it is possible. Hence their noticeable presence in the circulation has a favourable prognostic import. In asthma the eosinophilia is explained by the condition of semi-asphyxia and consequent change in the broncho-pulmonary epithelium produced by the accumulation of carbonic acid, a powerful hæmatic poison; all these factors uniting in causing a profound alteration in hæmatopoiesis and a requisition *in situ* of numerous eosinophile cells. In parasitic infection the greater or less amount of eosinophiles bears no relation to the nature of the parasite, but is associated only with the lesion caused by it and the tendency in the organism towards its encapsulation. In the granulomata, malignant tumours, and intoxications by hæmatic poisons there is a tendency in the organism towards the protection and repair of the injured tissues and organs and stimulation of the bone marrow to reproduction by the presence of the foreign bodies, which have to be got rid of or encapsuled. Professor Marchesini has observed in examining sections of liver infected with actinomycosis and echinococcus that the eosinophiles which are met with in large numbers are arranged in such a manner as to prove that they contribute entirely to the formation of fibrous tissue by means of their granular secretion. In tuberculous infection of the lungs, also, the eosinophiles are most numerous where necrosed tissue has been repaired by young connective tissue. As a result of his researches Professor Marchesini believes he has found the clue to the special function of eosinophiles in the organism—namely, that they must be regarded not as simple phagocytic cells, but as nutritive and plasmic cells of a high grade, having a special secretive power for defence, and for preparing a substratum for the rebuilding of substitution tissue wherever there are toxic substances to be neutralised, extraneous matter to be enveloped, animal parasites to be encapsuled, or destruction of tissue to be repaired.

SPRUE.

THE war has not resulted in many instances of this tropical disease being seen in this country, but its general prevalence in the East and its occurrence in certain parts of Australia suggest that we must be on the look-out for cases of this nature. Therefore, we think it will be useful to refer to an excellent summary of what is known of sprue, which is given by Dr. A. Breinl and Dr. H. Priestley in the *Medical Journal of Australia* for February. Sprue is a chronic inflammation of the alimentary tract, affecting chiefly the tongue, œsophagus, and small intestine. This leads to degenerative changes, ulceration, and to atrophy of the liver. Characteristic clinical features are the passage of numerous large, frothy, clay-coloured stools, the general intractability of the diarrhœa, the intermittent course, and the progressive wasting. The cause of sprue is unknown. It was thought that because, from the tongue and fæces of most of the cases, certain yeast-like organisms could be isolated that these were the causal agents. Castellani isolated quite a number of strains, and hints that they are the responsible organisms, as do also Bahr and Ashford; but it has been shown that similar yeasts can be obtained from patients suffering from diseases other than sprue. Animal experiments have been negative. Morbid examination shows hyperæmia of the œsophagus and small intestine, as well as ulceration, especially in the lower segments of the small gut. Similar ulceration may be present in the large intestine. The liver is invariably reduced in size. The pancreas is sometimes atrophic and fibrous; at other times it is normal. The onset of sprue is insidious, and the early stages may last for weeks or months. Generally the first definite symptom is soreness of the tongue. A few small rounded vesicles of whitish colour appear on the edge and tip of the tongue; later these break down, forming shallow ulcers with ragged edges, which persist for a varying period. At the same time there is a patchy desquamation of the epithelium which may spread over the dorsal surface, leaving an angry-looking, smooth, shiny surface. In the later stages the tongue presents a complete denudation of its epithelial layer and shows longitudinal and transverse fissures which bleed easily. Gastro-intestinal symptoms dominate the earlier stages. Obstinate indigestion, distension and flatulence,

and belching of gas occur during the whole course of the disease. Diarrhœa is present to a greater or less extent throughout. The stools vary in character, but often present their characteristic appearance. Sallowness and definite pigmentation come on; the skin shows atrophic changes and becomes dry and shiny. The general aspect of the patient alters and he becomes listless, depressed, and anxious. The temperature, blood, and urine show no changes. Sprue needs to be diagnosed from pellagra and from pancreatic disease. From the latter, diagnosis may be extremely difficult, especially as there is some probability that the pancreas is actually implicated in sprue; from pellagra the differences in the skin changes offer the most certain distinguishing features. Sprue may be fatal; if contracted late in life it nearly always is so, but early cases with suitable care, and especially by removal from the endemic area, may be cured. Treatment by drugs is disappointing; emetine and collosol argentum have been tried. Dietetic treatment is required. In the early stages a rigid milk diet is the best, and an ampler diet must be governed solely by the general condition and bowel activity of the patient.

HOSPITAL TREATMENT FOR POOR-LAW PATIENTS IN IRELAND.

A CURIOUS anomaly exists in the law governing the powers of Poor-law guardians in Ireland to provide special hospital treatment for Poor-law patients. The guardians have only power to send to the hospitals for special treatment such patients as are already inmates of the workhouse. They have no power to provide any special hospital treatment for the poor patients under the care of dispensary medical officers. It has long been the custom for dispensary medical officers, who considered patients to be in need of special hospital treatment, to have them formally admitted to the workhouse hospital, and forthwith despatched to a city hospital for the required treatment. It is clear that in many cases no other procedure would have provided the required treatment in time to be of service. Up to recently, the guardians and the Local Government Board recognised this fact, and no obstacle was put in the way of Poor-law medical officers obtaining for their patients whatever treatment they thought right. A few weeks ago, however, the guardians of the Listowel union, co. Kerry, found themselves surcharged by the Local Government Board auditor for the expenses incurred in obtaining special hospital treatment for a patient who had only spent one night in the workhouse, and had not been an inmate at the moment the guardians made an order authorising the treatment. If this ruling of the auditor is to be taken as laying down a precedent, it may interfere seriously with the efficient treatment of the sick poor in Ireland.

THE ETIOLOGY OF HÆMORRHAGIC RETINITIS.

A THESIS by M. Amsler based on 164 cases of hæmorrhagic retinitis occurring in Lausanne (*Correspond. bl. f. Schw. Aerzte*, 1917, p. 318) gives an interesting analysis of the etiology of this complaint. The cases were taken from both private and hospital practice. Stated in percentages, the etiological factors were as follows: Arterio-sclerosis, 55; heart disease, 8; albuminuria, 8; glycosuria, 3; menopause, 6. The percentage incidence in successive decades from 20 to 70 years was 4, 7, 13, 27, and 36 respectively, and 13 above 70 years. Nearly two-thirds of the cases were in women, and in them the prognosis was relatively more favourable, especially in the cases associated with the menopause. In 20 cases the typical picture of thrombosis of the central retinal vein was present, and in one of these—a woman aged 47 years—sight was restored in six months, and vision was still 4/5 four years later. The low percentage of cases of albuminuria in these statistics is somewhat remarkable, but tends to support the views recently expressed by Dr. P. C. Bardsley[1] that the prognosis in cases which show moderate vascular disease of the retina is not so bad as has generally been thought. As has been shown by Mr. Foster Moore,[2] cases of retinal vascular disease must be classified in various categories, the prognosis varying according to the particular type. It is therefore somewhat misleading to regard hæmorrhagic retinitis as a single clinical entity; it is a symptomatic condition which must be evaluated according to concomitant factors.

SUCCESSFUL OPERATION FOR A BULLET LODGED IN THE WALL OF THE LEFT VENTRICLE.

WE remarked last week that the surgery of the present war had furnished instances of the successful extraction of bullets from the heart substance, while removal from the heart cavity has been reported. At a meeting of the Académie de Medécine de Paris on March 3rd Professor Gaudier, of Lille, described an interesting case in which a bullet lodged in the wall of the left ventricle and had little disturbing influence on the heart's action. The patient was a Russian sergeant, aged 23 years, who was wounded near Monastir on Oct. 1st, 1916. While lying prone on the ground a bullet grazed the left parietal bone and passed through the supra-clavicular fossa. He became unconscious for a time which he could not fix, and was then able to get up. Finding himself alone, he walked until he met some soldiers. He was in a feeble state and walked with difficulty. He could not stand upright and advanced stooping forwards. He felt a severe pain at the apex of the heart, especially when he tried to straighten himself. While being carried to a dressing-station he again became unconscious and passed the night in that condition. He was taken by motor ambulance and train to Salonica. During the journey he regained consciousness, but suffered severely from pain in the region of the heart and could not lie on either side: he rested either on his back or on his abdomen. He was admitted to hospital, where the wound suppurated a little. He became very weak and the cardiac pain was continuous, and was increased by deep inspiration. He was sent to France, where he arrived on Oct. 27th with the parietal wound still suppurating but the supra-clavicular one healed. The pain still continued. About Oct. 15th he was able to get up and go about a little. His general condition was good. While resting the respiration was normal and the pulse 80. After going upstairs there was slight dyspnœa and the pulse varied from 85 to 90; there was no intermission. Auscultation showed nothing abnormal. He was put on ordinary diet and allowed to get about, but as the pain still persisted and there was some dyspnœa after rapid walking he

[1] British Journal of Ophthalmology, April, 1917.
[2] Quarterly Journal of Medicine, January, 1917.

was submitted to radioscopy, which showed that the bullet lay transversely near the apex of the heart and followed all the movements of the left ventricle. It was independent of movements of the diaphragm. Under ether the third and fourth left costal cartilages were exposed and divided, the pleura incised, and the "costal shutter" turned outwards by an assistant. The pericardium was incised vertically for a distance of 5 cm. The heart was seized in the left hand and brought outside the pericardium. In the anterior wall of the left ventricle was a transverse ridge 1½ cm. long above the apex. This was due to the embedded bullet, which was removed. The pericardial incision was closed with catgut and the cartilages sutured. During the operation there was an occasional intermission of the pulse. Recovery was complicated by cough and some fever and some scattered pulmonary râles were heard. The projectile was a leaden Bulgarian bullet, 42 by 7 by 5 mm., with a sheath of "maillechort," flattened at its centre. Similar cases are rare, but one almost identical has been recorded by Duvergen, of Bordeaux.

THE SPECIAL SCHOOL CODE

THE alterations in the regulations of the Board of Education for special schools for blind, deaf, defective, and epileptic children (Special School Regulations, 1917, Cd. 8505, price 3*d.* net, pp. 53) represent for the most part the changes necessary to bring the regulations more into accord with the best existing practice in special schools and also in ordinary public elementary schools. Since 1909, when the last regulations were issued, more extensive provision has been made for open-air education and playground accommodation; the new regulations ensure that special schools shall not fall short of the standard set by the present-day public elementary school. Again, the facilities afforded for the detection of mental and physical defects by the institution of the School Medical Service have resulted in an increase by 50 per cent. of the number of children in attendance at special schools. New types of schools have been provided; not only are partially blind and partially deaf children receiving appropriate instruction, but tuberculous and delicate children are afforded opportunities of attending open-air schools, where not only is the instruction more suited to their particular needs but their return to health is facilitated. In view of the duty placed on local education authorities by the Defective and Epileptic Children Act, 1914, of providing classes or schools for feeble-minded children, a statement of the present requirements of the Board in respect to the arrangements of special schools for mentally defective children is opportune. Among other important features is the provision that blind and deaf children should be examined from time to time by a medical practitioner possessing special ophthalmic or aural experience; in the case of schools provided by local education authorities the Board requires that the medical inspection and examination of the children should be conducted by the school medical officer of the authority or under his immediate supervision. In the case of blind children the Board points out that where suitably qualified blind teachers are on the staff of the school their services would be especially useful in giving touch-developing lessons to all the classes as well as lessons in Braille reading and writing. A further note of progress is sounded by the inclusion of regulations for trade schools for special school ex-scholars. The new regulations indicate that the interests of defective children are not being overlooked during the waging of a world-wide war.

MALARIA IN TRINIDAD.

A REPORT on malaria in Trinidad has been recently issued[1] by Dr. C. F. Lassalle, formerly acting assistant medical officer of health for the colony, but now, we understand, promoted to a higher and more responsible office in the Public Health Service of the island. This report is in three parts, relating to (1) a spleen census made in 1914; (2) an anopheles survey carried out in 1914–15; and (3) a description of the mosquitoes found in Trinidad during an inquiry made in 1915.

The spleen census.—The spleen census of 1914 is the second that has been carried out in Trinidad, the first having been made in the previous year, when out of 17,495 children examined 3134, or 17·91 per cent., had enlarged spleens. In the second spleen census now reported upon by Dr. Lassalle 25,927 children came under examination and 3658, or 14·1 per cent., showed splenic enlargement; in addition, 1576, or 6 per cent., of those examined were suffering from anæmia. The results of the Trinidad spleen census are compared with similar examinations carried out in other countries. In Mauritius, for example, in 1907–8, out of 31,022 children, 10,595, or 34·1 per cent., showed enlarged spleens; and in Ceylon, in 1908, out of 92,258 children submitted to the test, 31,421, or 34 per cent., had splenic enlargement. Compared with these other two island colonies the effects of malaria in Trinidad, as tested by the presence of enlarged spleen among the children, are not specially severe, and Dr. Lassalle predicts that, with enforcement of the appropriate preventive measures now in vogue, the colony will in the future show even smaller effects of malaria than at the present time. A number of statistical tables relating to the various areas in the island are appended to the report.

The anopheles survey.—Anopheles surveys of the districts comprised within the colony were begun on March 15th, 1914, and continued up to April 30th, 1915, when they had to be temporarily suspended. In all of the districts surveyed large and extensive mosquito breeding-grounds were found, as well as others of smaller extent. The work was carried out by sanitary inspectors who had been specially trained in the details of a mosquito survey. That it is possible to rid a town of anopheles has been completely proved in Trinidad. The city of Port of Spain, formerly infested by these insects, may be regarded as free, it being now a very rare occurrence to find an anopheles mosquito. Through the constant efforts of the sanitary department of the town even the formerly ubiquitous stegomyia and culex have almost disappeared. Dr. Lassalle remarks that it may be an impossibility—mainly on account of financial considerations—to eradicate every single mosquito breeding place throughout the colony, but "it is entirely within the range of practical politics" to carry out a scheme of destruction of anopheles breeding grounds within, and for a certain distance around, all towns and villages, plantations, and

[1] Trinidad Malaria Report. By C. F. Lassalle, Acting Assistant Medical Officer of Health. The Government Printing Office, Port of Spain. 1916. Pp. 126.

other centres of population. It is obvious that the reduction of the danger of malaria in a locality must be directly proportional to the reduction of the number of breeding places—the intensity of malaria infestation bearing a direct ratio to the number of mosquitoes regularly hatched out. Dr. Lassalle therefore recommends as a first step in a new campaign against malaria in Trinidad that anti-mosquito regulations applicable throughout the entire colony should be introduced at once.

The mosquitoes of Trinidad.—In his report on the mosquitoes of the colony, Dr. Lassalle says that the collection of eggs, larvæ, adults, &c., obtained in the course of the above-mentioned anopheles survey provided material for the study of the varieties of Trinidad mosquitoes in a more comprehensive manner than would otherwise have been possible. Specimens were sent to the British Museum, the Imperial Bureau of Entomology, and to the Bureau of Entomology, Washington, for the identification of certain species. A complete list is given of all the Trinidad mosquitoes now known, and a description is also furnished of the most important and best-known species. Dr. Lassalle discusses the association of anopheles larvæ and fish in natural breeding-places. There seems to be some difference of opinion regarding the value of larvivorous fish in keeping down the breeding of anopheles under natural conditions. In concluding his report Dr. Lassalle expresses the opinion that further investigations will doubtless unearth other species of mosquito.

CERTIFYING SURGEONS AND COMPENSATION FOR LOSS OF INCOME.

CORRESPONDENCE has recently passed between the Association of Certifying Surgeons and the Home Secretary on the possibility of compensation being granted to those surgeons who have lost income in consequence of the abolition of investigations into accidents. A loss of £12,000 per annum has been incurred by the medical profession as the outcome of the economical decision of the Home Office to dispense with these investigations, and most of this loss falls upon surgeons who hold important appointments in manufacturing districts, quite a number of them suffering to the extent of between £200 and £300 a year. It was pointed out by the association that surgeons holding the better appointments had given up other work by arrangement with the Home Office, and that many had combined the duties with those of other public appointments, such as medical officer of health, when the loss could not be made good by taking fresh work. The association represented also that when public officials holding appointments on similar terms are dispossessed compensation invariably follows. The Home Secretary, we learn, does not see his way to grant compensation, considering that the terms of employment preclude it, and that the increase of remuneration under certain new duties should be compensatory. But the association has pointed out that the new duties of their members had been of very little monetary advantage to them outside the Pottery districts, the most remunerative work of the kind instanced (that of appointed surgeon under special rules) being open to the whole profession.

Mr. John H. Morgan, C.V.O., has gone to France in the service of the Croix Rouge Français, and is taking command of a large hospital at Nevers.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Health of Belfast.

AT a meeting of the city council of Belfast, held last week, it was reported that from Feb. 8th to March 17th 96 cases of infectious disease had been notified—viz., 10 cases of typhus, 36 of typhoid, 25 of scarlet fever, 12 of diphtheria, and 13 of erysipelas. During the four weeks ended March 17th last there were actually 12 more deaths than births (751 to 739), 52 of the deaths being due to zymotic disease. 112 deaths were due to pulmonary tuberculosis, 136 to respiratory diseases (exclusive of pneumonia), and 108 to pneumonia. The annual average death-rate from all causes was very high—24·9—while in the corresponding period of 1916 it was 20·2. The unwelcome reappearance of typhus (20 cases in all), the prevalence of typhoid (upwards of 90 cases at present in the Fever Hospital), and the rise in the general death-rate are all disquieting features of the present health of the city.

The Belfast Ophthalmic Hospital.

At the annual meeting of the Belfast Ophthalmic Hospital held on April 6th it was reported that during the year 1916 there had been treated 4206 cases of eye disease and 1704 cases of diseases of the ear and throat; 129 urgent cases were admitted to the wards for morning dressings and 204 patients attended, making a total of 6243 passing through the hospital. During the past two years, owing to five of the surgeons to the hospital being engaged elsewhere in war work, the out-patient department had only been opened on two days a week, yet the number of patients had increased, and Dr. J. W. Browne, the senior member of the staff, single-handed, has carried on all the work. Financially there was a balance of £28.

Hilden Convalescent Hospital, Belfast.

Through the generosity of a well-known member of an old Belfast family—Mrs. Harold Barbour—(who gave £2000 for the equipment of the institution, and has, in addition, undertaken to subscribe £1000 per annum for its maintenance during its existence) another hospital has been founded in Belfast and district for the reception and treatment of wounded soldiers. It is called the Hilden Convalescent Hospital, having been named after the great thread works with which the Barbour family is associated, and is situated in one of the healthiest districts of Belfast, Galwally Park. It has been established by the Ulster Joint Committee of the British Red Cross Society and the Order of St. John, and is the first hospital opened by these organisations in Ulster. A grant of £3000—part proceeds of "Our Day" collection—has been received from the Red Cross. The institution itself, which will be shortly opened, contains 51 beds for patients and an extensive wooden building, in course of erection, as a wing to the main hospital, will accommodate an additional 75 beds. The medical staff so far appointed is as follows, all the officers being honorary:—Medical superintendent, Dr. John Macintosh; visiting surgeon, Dr. James Taylor; visiting physician, Dr. J. R. Davison; consulting physicians, Sir John Byers, Dr. R. W. Leslie, Dr. H. L. M'Kisack, Dr. W. L. Storey, and Dr. W. Calwell; consulting surgeons, Dr. Robert Campbell, Dr. Howard Stevenson, and Dr. S. T. Irwin; anæsthetist, Dr. V. C. L. Fielden; radiographer, Dr. S. Allworthy; surgeon-dentist, Mr. S. A. Deans, L.D.S.

Maternity and Child Welfare.

At the annual meeting of the Belfast Health Society, held in the city hall, Belfast, the Lord Mayor presiding, the total attendance of mothers and infants at the various "babies' clubs" was reported to have nearly reached 8000, while 8145 pints of milk had been distributed, the mothers paying half the cost. An address on child welfare was given by Sir John Byers, who suggested that Belfast should take part in the proposed National Baby Week, to be held from July 1st to 7th.

April 10th.

CENTENARIAN.—Mrs. Elizabeth Elvy has died at Eastling, Faversham, in her 101st year.

Public Health.

REPORTS OF SCHOOL MEDICAL OFFICERS.

In *Berkshire* the number of elementary school children under the county education authority was 22,500 in 1915. The number of children examined as entrants, intermediates, and leavers was 2596. The acting school medical officer, Dr. W. Sisam, states that from May onwards the routine medical inspections had to be suspended, owing to depletion of the medical staff.

Nutrition was found to be satisfactory in 87 per cent., and in only 0·65 per cent. was it actually bad. Cleanliness was satisfactory in 99 per cent.; in no child were pediculi found on the body, and only in six cases were they found in the head. The eyesight was normal in 85 per cent. of the children tested, and in only 5·5 per cent. was it 6/18 or less. Organic heart disease was found in 19 children (0·73 per cent.); in 10 children (0·38 per cent.) pulmonary tuberculosis was diagnosed, and in 79 (3·04 per cent.) it was suspected. Non-pulmonary tuberculosis (glandular, articular, &c.) was found in 10 other children (0·38 per cent.). The only treatment undertaken by the Education Committee was that for ringworm by means of X rays, which was carried out at Reading, Newbury, and Oxford in 47 cases with satisfactory results.

An education area entirely rural in character and occupation is that dealt with in Dr. Frank Robinson's report on schools in *Cambridgeshire* during 1915, the borough of Cambridge not being included. The number of children on the register was 12,406, of whom 3637 were examined according to the routine inspection of age-groups.

Nutrition was satisfactory in 83·7 and "very bad" in 1·3 per cent. In only two children were pediculi found on the body (0·05 per cent.) and in 13 cases (0·35 per cent.) in the head. The vision was normal in each eye in 85 per cent. of the children tested. In 6 children (0·16 per cent.) organic heart disease was diagnosed. Only in 1 child was pulmonary tuberculosis definitely found to be present, but in 19 it was suspected (0·52 per cent.); in 11 others non-pulmonary forms of the disease were found. Ringworm shows a most satisfactory decline compared with former years, only 6 cases having been met with in routine inspection. In one school there were 5 cases in one family (specially inspected), the father persistently refusing treatment, in spite of "repeated visits by the medical staff during the year," until prosecution was threatened. This demonstrates the necessity for prompt action in dealing with culpable ignorance or obstinacy of this kind. The percentage of unvaccinated children, which in 1909 was 6·3, has now risen to 19·1, and in the youngest children newly admitted to school is as high as 43·5, compared with 6·7 per cent. in 1909. The examination of visual defects has been carried out satisfactorily in the outlying districts by Dr. Jessie Gellatly, a portable electrical ophthalmoscopic apparatus, with trial lenses, test-types, &c., adapted for bicycle transport, having been employed, at a total cost of £8 15s.; retinoscopy is done in the school cloak-rooms, the windows being brown papered. Infectious disease was exceptionally heavy in 1915, measles necessitating 87 school closures. Swabbing for diphtheria was extensively practised with good results; positive evidence of infection was obtained in 31 cases.

In presenting his report on schools in *Cheshire* Dr. Meredith Young, the chief school medical officer, alludes to the strain on the administration during the year owing to war conditions. The children examined in the entrant, intermediate, and leaver groups during 1915 numbered 17,890.

Nutrition was below normal in only 7 per cent., and in no case was it actually bad. Cleanliness of the body was also satisfactory in all but 2 per cent., and pediculi were only found in 0·3 per cent.; in 0·6 per cent. they were present in the head. Normal vision in each eye was found in 71·4 per cent. Organic heart disease was diagnosed in 48 children (0·27 per cent.); pulmonary tuberculosis was detected in 17 children (0·09 per cent.) and suspected in 42 others (0·23 per cent.); tuberculosis other than pulmonary was met with only in 34 children (0·19 per cent.). Attention is drawn by Dr. Margaret Ormiston, assistant medical officer for South Cheshire, to a senseless but very common practice in the clothing of children—viz., the excessive number of garments covering the chest and trunk, as many as 11 layers being sometimes met with; while very short frocks and bare knees may lead to chill of the extremities and "growing pains." Children suffering from ringworm of the head are allowed in school if provided with a properly fitted cap until cured. This procedure was found to be quite satisfactory. Thyroid enlargement is reported as being prevalent in the rural districts of Nantwich union and in the Middlewich area, several members of a family being affected in many instances, and transmission being mostly through the maternal relations. This would be an interesting subject for investigation, as goitre, or "Derbyshire neck," has not been hitherto noted in this part of the country.

Owing to depletion of the medical staff on account of the war the work of school medical inspection in the county of *Durham* was limited, during the latter half of 1915, to the examination of ailing and defective children and to re-inspection of children previously found to need treatment. Previous to this, 16,126 entrants and leavers had been examined by Dr. T. Eustace Hill and his assistants.

Nutrition was on the whole satisfactory, being considered bad in only 0·8 per cent.; in an additional 10·5 per cent. it was below normal. Cleanliness was also satisfactory, body vermin being found in only 0·3 per cent. and pediculi capitis in 1·1 per cent. Organic heart disease was detected in 91 children (0·6 per cent.); 57 of these were girls (0·72 per cent.) and 34 boys (0·4 per cent.), showing a marked discrepancy in the sex incidence. Pulmonary tuberculosis was found in only 9 children (0·05 per cent.), but was suspected in 36 other cases (0·2 per cent.); non-pulmonary forms were diagnosed in 0·3 per cent. Energetic measures were taken in regard to the presence of vermin, under Section 12 of the Children Act, and in some bad cases of neglect the parents were sent to prison. Unfortunately, no treatment is undertaken by the county Education Committee, except for defective vision, and owing to the absence of the school oculist on active service comparatively few cases received attention.

Dr. J. Middleton Martin's report on *Gloucestershire* schools deals with the routine inspection of 10,579 children, as well as with 3598 special examinations.

Of the former category, comprising the entrants, leavers, and intermediates, the nutrition was below normal in 16·86 per cent., but in only 0·09 per cent. was it actually bad. Body cleanliness was satisfactory in 94·5 per cent., body vermin were found in only a single instance; on the head they were found in 15 children (0·14 per cent.), all being girls except two. Great improvement has taken place in regard to this condition, the number infected being only about half what was found when examination by the nurse was instituted first in 1908, and a badly infected head being now rarely discovered. In the Tetbury urban district the percentage of infection has been reduced from 39 in 1909 to 7 in 1915. Vision in the right eye was perfect in 86 per cent. and in the left eye in 85 per cent.; the proportion of children having normal vision in each eye is not stated. Organic heart disease was diagnosed in 298 children (2·82 per cent.); 134 of these were among the entrant infants, giving a percentage of 2·91, which seems to be remarkably high. Pulmonary tuberculosis was only found in 3 cases (0·03 per cent.) and suspected in 15 others; in 11 children non-pulmonary forms were found. Treatment for teeth is carried out by the county authority as well as, in certain districts, by voluntary agencies supported by local effort. Infectious diseases were especially prevalent in 1915, and 206 departments had to be closed on this account—nearly double the previous maximum of 118 in 1913. There were, however, fewer cases of infectious skin disease (ringworm, impetigo, and scabies) than in any previous year.

In *Kent* the number of children on the roll of schools under the county education authority was 84,707 and the number examined during 1915 in the code groups was 20,509.

Of these children 94 per cent. were well nourished, and only 0·1 per cent. were in a bad condition in this respect; 92·2 per cent. were clean as regards the body. Defective vision was much more prevalent among girls (13·2 per cent.) than among boys (9·6 per cent.). Heart affection (organic or functional not distinguished) was diagnosed in 2·1 per cent., being somewhat more frequent in girls (2·4 per cent.) than in boys (1·9 per cent.). Tuberculosis of the lungs was found in 0·6 and suspected in an additional 0·3 per cent. and other forms of the disease in 0·1 per cent. As to the age-incidence of the specific fevers in children an interesting table shows that 50 per cent. of the boys aged 5 had already had measles. At the age of 9 the percentage was 76·3; at 13 it was 83·9. The analogous percentages for whooping-cough were 34·6, 51, and 51, and for scarlet fever 2·8, 6·4, and 11·2 respectively. For diphtheria the ratios were 1·5, 3·5, and 8·2 per cent. The ratios for girls were for each disease very similar to those of the boys. A table of heights and weights of 2000 boys and 2000 girls shows that in height boys and girls (in Kent) are almost equal at 9 years of age (49·7 and 49·8 inches), and at 13 years (55·6 and 55·8 inches). In weight the girls outgrow the boys in these four years: at 9 years the boys average 56·1 lb. and the girls 54·6 lb; at 13 years the boys have increased to 75·7 lb., but the girls have gone up to 77·4 lb. The relative increase is, however, not so marked as in children in London, where girls of 13 are on an average nearly 3 lb. heavier than boys of that age. The condition of enlarged tonsils and adenoids (not differentiated) was diagnosed in 24·7 per cent. of the boys and 23·4 per cent. of the girls. An abnormally large proportion in a group of cases was found among children habitually taking their dinner at school because of distance from their home or for some private reason; the prevalence among these children was three times as great as among those who go home ..... The connexion of this condition with deafness was shown by the fact that out of 516 cases of defective hearing in 28·2 per cent. enlarged tonsils were present. It is gratifying to hear that care of the teeth is becoming general, the demand for toothbrushes almost exceeding the supply provided by the Education Committee.

Owing to war conditions the routine medical inspection of school children in *Norfolk* during 1915 had to be suspended in April. Matters requiring urgent attention and the management of outbreaks of infectious disease, also the examination of children specially brought forward by the teachers as needing medical care, were dealt with by Dr. J. T. C. Nash, the county medical officer of health, personally during the remainder of the year. His report deals with a total number of 3847 children submitted to the routine examination.

Of these children 86·93 per cent. were well nourished, and in only 0·18 per cent. was the nutrition actually bad. All the children were clean except 1·5 per cent., and in only one child were body vermin found to be present. Organic heart disease was diagnosed in 0·18 per cent., and non-pulmonary tuberculosis in 0·32 per cent. Not a single case of tuberculosis of the lungs was definitely diagnosed, and in only one child was it suspected. Defective vision (less than 6/9 in either one or both eyes) was found in 7·93 per cent. The provision of X ray treatment for ringworm being impracticable, systematic application of mercurial ointment was carried out in a ringworm class of 33 children with such good effect that at the end of the year there were only two children still uncured.

In *Northamptonshire* the work of medical inspection in 1915 was carried out by Miss M. J. Keers, M.B., after the departure of Dr. J. H. Mason on military service in April; 4571 children were systematically examined.

Of these 95·4 per cent. were well nourished, and only one child was considered to be actually in a state of malnutrition; 95·4 per cent. also were clean, and in only three instances were body vermin detected. Organic disease of the heart was present in 0·59 per cent. and pulmonary tuberculosis in 0·46 per cent., other forms of this latter disease being found in 0·24 per cent. Normal vision was present in 67 per cent. of the 1898 children tested. The weights of the boys (73½ lb.) and girls (73¼ lb.) in the urban districts at 12 to 13 years of age were practically equal; in the rural districts the corresponding figures were 74¾ lb. for the boys and 77¼ lb. for the girls. In concluding his report Mr. Charles E. Paget, the county medical officer, notes that, owing to the war, a larger number of children than usual have failed to receive treatment, especially in respect to defective vision and throat cases.

In *Warwickshire*, during the early part of 1915, the routine medical inspection of 1979 school children was carried out in addition to special examinations; after June 1st, owing to war conditions, only children specially selected by the teachers and health visitors were examined, to the number of 1112.

A considerable proportion of defects was found in these "special" cases, treatment of which was undertaken with benefit; the interruption of the routine inspection, though making a regrettable hiatus in the progressive improvement of the health of the school children in the county, was probably unavoidable. Verminous heads and ringworm give a good deal of trouble, and treatment of these cases in rural districts is full of difficulty, as the distance from the nearest practicable treatment centre is often considerable. "No scheme for the provision of treatment by the county council of defects found in school children has yet been adopted." Dr. Bostock Hill mentions the difficulties that have been experienced in carrying on the work of medical inspection on account of the war, and is satisfied with the results that have been obtained Of the 1979 children examined as entrants and leavers nutrition was below normal in 15·2 per cent., being actually bad in only 0·4 per cent.; body cleanliness was unsatisfactory in 4·1 per cent., organic heart disease was detected in 0·9 per cent., and pulmonary tuberculosis in only 0·1 per cent.

The report on school medical inspection in the *West Riding of Yorkshire* in 1915 is very short on account of the absence of nine of the medical staff (including Dr. J. R. Kaye, the school medical officer) on military service. The work has been maintained in spite of difficulties due to this cause. The number of scholars on the school roll was 200,513, of whom 38,023 were examined at the routine inspections, besides 18,971 special cases.

Of the routine cases—entrants, intermediates, and leavers—0·18 per cent. were poorly nourished, and 14·26 per cent. were verminous as regards the head. Pulmonary tuberculosis was diagnosed in 0·23 per cent., and other forms of tuberculosis in 0·38 per cent. Of the whole number of children—entrants, intermediates, and leavers—26·70 per cent. were unvaccinated; of the entrants the proportion was 45·60 per cent. of the leavers 14·69 per cent. These figures speak for themselves. At 17 secondary schools the entrants were inspected; of ages 11 to 14 17·14 per cent. were unvaccinated, and 6·31 per cent. were verminous. It is unfortunate that several of the care committees have ceased to exist, leaving in their respective districts the whole visiting work to be done by the school nurses.

URBAN VITAL STATISTICS.

(Week ended March 31st, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18,000,000 persons, the annual rate of mortality was 17·7, against 18·5 and 16·5 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 17·8, or 0·3 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 4·7 in Ealing, 5·4 in Acton, and 8·4 in Oxford, to 24·5 in Bolton, 24·7 in Rochdale, and 25·5 in Plymouth. The principal epidemic diseases caused 406 deaths, which corresponded to an annual rate of 1·2 per 1000, and included 252 from measles, 57 from whooping-cough, 43 from infantile diarrhœa, 41 from diphtheria, 10 from scarlet fever, and 3 from enteric fever. The deaths from measles showed a further increase compared with the numbers recorded in the nine preceding weeks, and caused the highest annual death-rates of 3·3 in Plymouth and in South Shields, 3·9 in Ilford, 4·0 in Walsall, and 7·2 in Dudley. The 795 cases of scarlet fever and the 1377 cases of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 22 and 100 below the numbers at the end of the previous week. Of the 5866 deaths from all causes in the 96 towns, 181 resulted from violence. The causes of 54 of the total deaths were uncertified, of which 11 were registered in Birmingham, 8 in Liverpool, and 4 each in London, Manchester, and South Shields.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death rate was equal to 17·9, against 18·3 and 16·2 per 1000 in the two preceding weeks. The 418 deaths in Glasgow corresponded to an annual rate of 19·5, or 3·2 per 1000 above that recorded in the previous week, and included 28 from whooping-cough, 16 from measles, 5 from infantile diarrhœa, 3 from diphtheria, 2 from scarlet fever, and 1 from enteric fever. The 116 deaths in Edinburgh were equal to a rate of 18·2 per 1000, and included 7 from whooping-cough, 5 from measles, 2 from infantile diarrhœa, and 1 each from scarlet fever and diphtheria.

Irish Towns.—The 172 deaths registered in Dublin were equal to an annual rate of 22·5, or 3·8 per 1000 below that recorded in the previous week, and included 17 from measles, 7 from infantile diarrhœa, and 1 each from whooping-cough and diphtheria. The 133 deaths in Belfast were equal to a rate of 17·6 per 1000, and included 4 from measles, 2 each from enteric fever and infantile diarrhœa, and 1 from scarlet fever.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

To be Temporary Surgeon: F. A. Knott.

The following appointments have been notified:—Fleet-Surgeon: A. Woollcombe to *Pembroke*. Temporary Surgeons: R. W. Townley and J. L. Pringle to *Pembroke*.

ROYAL NAVAL VOLUNTEER RESERVE.

J. T. Wood, L.D.S., to be temporary Dental Surgeon.

ARMY MEDICAL SERVICE.

Col. H. A. Bruce, Canadian A.M.C., to be temporary Colonel.

TERRITORIAL FORCE.

To be Deputy Assistant Directors of Medical Services: Major W. E. Miles and Capt. H. Pinto-Leite.

ROYAL ARMY MEDICAL CORPS.

A. J. J. Johnston, Surgeon-General, R.N. (ret.), to be temporary Lieutenant-Colonel.

Temp. Major A. G. P. Gipps to be temporary Lieutenant-Colonel.

Temp. Major E. Webb-Johnson, D.S.O., to be acting Lieutenant-Colonel whilst commanding a General Hospital.

Captains to be temporary Majors: L. J. Rhea, Canadian A.M.C., N. B. Gwyn, Canadian A.M.C., C. Wollard, Canadian A.M.C., and S. R. Harrison, Canadian A.M.C.

To be temporary Majors: Temp. Capts. W. P. Yetts and Wilford V. Robinson (whilst commanding troops on a hospital ship); E. C. Stabb (while employed at the Manor County of London War Hospital).

T. G. Moorhead to be temporary honorary Major.

Temp. Capt C. G. G. Keane to be Lieutenant and to be granted the rank of temporary Captain.

Temp. Capt. J. D. Gimlette relinquishes the rank of temporary Major on reposting.

The undermentioned are granted temporary honorary rank whilst serving with No. 22 General Hospital:—As Lieutenant-Colonel: H. Cabot. As Major: G. C. Shattuck, E. G. Crabtree As Captain: E. S. Bridges. As Lieutenant: E. D. Busby, E. S. Welles, F. B. Grinnell, E. S. Fish.

To be temporary Captains: Lieut. T. C. Bowie and C. Robinson, Temp. Lients. E. H. Wheeler and F. G. Thomson and F. S. B. Fletcher, S. G. Billington, H. S. Berry, G. B. Flux, B. N. Murphy, M.C., late Captain R.A.M.C.

To be temporary Lieutenants: H. McLean, R. G. Maglione, R. Appleton, S. W. Milner, J. E. Mitchell, J. B. Wilkie, G. McNeill, H. C. Quirke, T. McFetridge, W. L. G. Anderson, H. C. W. Wood, W. G. Attenborough, A. G. Stewart, R. B. Fletcher, J. G. B. Smith, E. A. Price, N. Glegg, W. H. Miller, C. P. A. Stranaghan, P. Murphy, R. J. Croxford, A. E. Baron, E. C. Tamplin, F. Jubb, Temp. Hon. Lieut. T. B. Johnston, A. M. Caverhill, L. N. Morris, C. H. Wagner, T. B. Davies, H. L. Blackley, A. Armer, J. B. McDougall, D. S Clarke, J. B. Ball, N. S. Lucas, D. Young, A. A. Wilkinson, H. E Graham, R. A. Campbell, H. Bardsley, A. W. Hare, W. L. M. Day, E. Wragg, G. Nelson, D. W. Anderson.

Officers relinquishing their commissions: Temp. Capts. D. Lawrie and T. J. S. Moffett, Temp. Lieuts. D. C. Wilson, W. J. Greehy, and C. B. Richardson, and Temp. Hon. Lieut. W. H. Thomas (having ceased to be employed with the British Red Cross Society in France).

SPECIAL RESERVE OF OFFICERS.

Lieutenants to be Captains: D. R. Hennessy, J. A. C. Kidd, S. J. V. Furlong, J. Y. McLean, D. Roger.

A. H. Mitchell, from Aberdeen University Contingent, O.T.C., and J. R. John, from London University Contingent, O.T.C., to be Lieutenants.

Capt. W. J. Reid relinquishes his commission.

TERRITORIAL FORCE.

Major E. C. M. Foster to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Major W. E. Miles is restored to the establishment on vacating the appointment of Deputy Assistant Director of Medical Services.

Capt. T. S. Allan to be temporary Major whilst in command of a Military Hospital.

Capt. H. Pinto-Leite is seconded while holding the appointment as Deputy Director of Medical Services.

To be Captains: Capt. A. J. W. Stephen (from Northern General Hospital); and Lieuts. J. S. Cooper, J. B. Hogarth, H. England, P. G. Phillips.

Lieutenants to be temporary Captains whilst serving with the Medical Unit of the University of London Contingent, Senior Division, O.T.C.: J. H. Raffel and W. Wright.

A. G. Harrington to be Lieutenant.

Capts. A. J Archibald and W. Love relinquish their commissions on account of ill-health. Capt. W. J. Deighan relinquishes his commission on account of ill-health, contracted on active service, and is granted the honorary rank of Captain. Capt. F. W. A. Stott, Attached to Units other than Medical Units, relinquishes his commission on account of ill-health.

VOLUNTEER FORCE.

A. F. Turner (late Lieutenant 2nd V.B. Gloucestershire Regiment), to be temporary Captain and Medical Officer 3rd Battalion Gloucestershire Volunteer Regiment.

INDIAN MEDICAL SERVICE.

Lieut.-Col. H. B. Neiville, on return from leave, has been posted to Gorakhpur as Civil Surgeon, Brevet Col. H. F. Cleveland has been appointed Deputy Director-General, vice Lieut.-Col. F. E. Swinton, and Lieut-Col. James has been elected a member of the Punjab Medical Council. Capt. R. H. Bott has been elected an ordinary Fellow of the University of the Punjab.

Col. le Bel, the chief doctor of the French-Canadian Hospital at St. Cloud, has been presented with the Cross of the Legion of Honour.

Correspondence.

"Audi alteram partem."

"SOLDIER'S HEART."

To the Editor of THE LANCET.

SIR,—The remarks of Captain Adolphe Abrahams[1] and the comments of Dr. Thomas Lewis have much interested me, and perhaps I may be pardoned for again trespassing upon your space.

The opinion of both Captain Abrahams and of Dr. Lewis upon cardiac strain seems to me to be particularly valuable. Although I cannot lay claim to the athletic distinction of Captain Abrahams, yet I have been capable of prolonged and strenuous exertion, and having been at the same time interested in morbid affections of the heart, naturally I have paid some attention to the effect of exercise upon the heart. As an illustration of the fact that I have at times put my own heart to more or less severe tests, it may be mentioned that although I have long passed the age of youth, in the month of April preceding the outbreak of war I rode on an ordinary "push-bicycle" from Taz-malt in Algeria to Algiers, a distance of 179 kilometres (112 miles) in nine and a half hours, although my low gear was out of order and could not be used. All the hills were ridden, some of them no mean ones, and the ride ended over a road paved for six or seven miles with cobble-stones. The ride also happened to have been during an unusually hot spell of weather for the month of April. I was told that the thermometer on the day of my ride had registered 98° F. in the shade in Algiers at one hotel.

While it has not fallen to my lot to meet with opportunities upon which to base an opinion regarding the question of cardiac strain such as have fallen to Sir Clifford Allbutt and to Captain Abrahams, it has always appeared to me that an "athletic heart," if it occurs at all, must be so rare as to require to be classed under the heading of medical curiosities rather than of pathological conditions worthy of serious attention. Yet during an experience in the post-mortem room covering about 2500 necropsies I met with three instances of great enlargement of the heart which, by excluding all other possible causes of enlargement, appeared with some reason to have been consequent upon prolonged physical exertion. But two of those cases occurred in stokers in gasworks, and the third in a blacksmith. It is obvious that in those cases strenuous work was carried on under unusual conditions—namely, under the influence of great heat—and the question arises whether the heat may not have been the more important factor in leading to the cardiac enlargement. During heavy work in a hot atmosphere most of the water drunk must be passed off by the skin, comparatively little by the kidneys. Toxic products of metabolism may be retained and the heart suffer in consequence. A good example of toxic enlargement of the heart, it may be mentioned in passing, is the enlargement which is not so very uncommonly met with as a result of excessive indulgence in alcohol, but alcohol as a cause for enlargement in the above cases was as far as possible excluded.

However reasonable or unreasonable my theory may be regarding a toxic causation for enlargement of the heart occurring in association with prolonged arduous work, it is a sufficient supply of fluid that I require to enable me to arrive at the end of a long ride feeling capable of doing as much again. Captain Abrahams attributes the warding off of fatigue during one of his physical feats to a good meal. It seems to me that if the circulation benefits from the solid constituents of a meal taken during exercise it can only do so because the food acts as a mechanical stimulus to the abdominal vaso-motor system, a stimulus which, of necessity, reacts on the general circulation. The muscles can derive no direct benefit from the meal until time has allowed digestion to take place, whereas the influence of a meal on the sense of well-being is almost immediate. Some persons may require abdominal stimulation of the vaso-motor system during strenuous exercise, in others fluid taken in sufficient quantity to make up for the loss of water by perspiration may be all that is necessary. It is true that in the above-mentioned ride I drank two bottles of sweet lemonade and two large cups of café-au-lait containing sugar, and thus took a rapidly diffusible food in the form of sugar; but on several occasions during a ride of nearly 1300 miles in Algeria and Tunisia, including a ride from Algiers to Tunis, I frequently had water only in the course of the day, which fortunately could often be procured clear and fresh in the mountainous and hilly districts.

In addition to physical conditions affecting the circulation, as Captain Abrahams points out, the mind also has its influence. A child may run about all day after butterflies and show no sign of fatigue, but become hopelessly tired after an hour's dull walk. The athlete may have an object in view and feel no fatigue until the object is attained. This is not the case with the soldier. Most of his exercise is undertaken with no other stimulus than that of fulfilling, it may be, dull duty. He is at a disadvantage in another way. The athlete's feats are more often than not spasmodic. Consciously or subconsciously, should he overstrain in some measure his physical powers he, by a diminution in outlet of energy, allows time for recuperation. The soldier is not his own master in such matters, and in the absence of sufficient time for recuperation the nervous balance of the vaso-motor system may be upset.

The athlete will, I think, if he study his own circulation for a day or two after some feat in which he had put a strain upon his physical powers, great even for himself, find some departure of the vaso-motor system from its usual smooth working. This is most likely to take place when strenuous exercise has not previously been undertaken for some time, but it seems to me that slight temporary disturbance of the vaso-motor system may undoubtedly occur. The conditions of life of the athlete are such that he suffers no harm. The conditions of the soldier may be otherwise.

I am, Sir, yours faithfully,

April 2nd, 1917. THEODORE FISHER.

[1] THE LANCET, March 24th, 1917, p. 442.

To the Editor of THE LANCET.

SIR,—With Captain Adolphe Abrahams's conception of the "soldier's heart,"[1] with his observation of the aggravation of that condition which frequently appears to result from much attention being called to it in cordaria or in general hospitals, and with his experience of the natural disinclination manifested by some who have suffered from it again to "face the music" of outrageous war my own views and experience largely agree. The "defensive neurosis" of which he writes is certainly shown by some, although not by all. Others are bravely anxious to resume duty and do so, and I have found this even among "gunners," whose "job," to use a Service term, is more arduous than that of some other branches.

The psychical and neural factors, as I have before argued, play a large part in some cases of *persistent* soldier's heart, but a tedious or protracted form of this condition is met with also in the unemotional and stable man who is physically played out and whose nervous system doubtless manifests changes not otherwise expressible at present than by such terms as the loss of reserve force or exhaustion. The prospects of even a young and healthy man, who has escaped invalidism and injury and been actively engaged in modern warfare for 18 months or 2 years and who shows the "soldier's heart" (the advent of which, in some cases, is precipitated by a "shell shock"), of again being able to resume full duty are not good. Who can say that such a one has not earned relief from work in the fighting line, although there is no release in war? He has "done his bit" and may find useful war work elsewhere than on the stricken field.

It is, however, to another point in the heart of the soldier, as distinguished from the "soldier's heart," that I wish now briefly to allude, conceiving the point to be of practical importance. Captain Abrahams's remarks, if I may without offence say so, have, on the whole, a commendable reserve and balance, but I would respectfully suggest that as an adherent of the new cardiology—the modern aspect of heart disease, to use the phrase of the last Lumleian lecturer—he has revived, in his contempt for the cardiac bruit, a view which, I had hoped, was fast finding a richly deserved quietus. The "purrs," "barks," "roars," and "squeaks" of the heart are not

[1] THE LANCET, March 24th, p. 442.

precisely analogous to the various grunts of an efficient motor-car. In making this comparison Captain Abrahams doubtless is, however, rhetorical rather than instituting that analogy which has been well called the fruitful mother of many errors.

Many systolic bruits, transient or extracardial in nature, which are usually easily diagnosed and have frequently been fully appreciated, are, of course, negligible. But with all due regard for the value of integrity in muscular power (the importance of which, so far as I know, has for long been recognised even by those who find some wisdom in *old* aspects of heart disease) is it contended, may I inquire, that it is an excellence in the cardiac mechanism to possess a defective valvular apparatus? The new cardiologist, who regards with some complacency his additional enlightenment, would appear at times to think so. Is the career of a soldier one to be chosen by those who possess even a mitral lesion which has survived with impunity the calls of civil life and shows when examined no material enlargement or dilatation of the organ? Experience answers, Certainly not. Organic valvular disease, direct and reflux, which has been overlooked or ignored, and notwithstanding exceptions to the rule, has frequently been found to lead to hopeless invalidism, and at times even to the death of the soldier. So well established is this fact that no medical officer, however "modern" his outlook on heart disease, would be justified in subjecting the bearer of such a lesion to the exertions and vicissitudes of the soldier's life in war. It is to emphasise again this point, on which a considerable experience enables me to speak with conviction, that I write these lines. Fortunately, the Army Medical Service as a whole, and in spite of "modern" conceptions, continues to prefer an entire to a broken pump in the circulation, even when the break is only in the wash-leather.

I am, Sir, yours faithfully,

ALEXANDER MORISON.

Upper Berkeley-street, W., April 2nd, 1917.

THE LUMLEIAN LECTURES ON HEART DISEASE.

To the Editor of THE LANCET.

SIR,—There is one point in the modern study of heart disease which, I think, hardly meets with the recognition that it deserves, and I venture to believe that in the future it will greatly alter the attitude of the medical profession to this study. It is this: that we can from the most frequent cause of heart disease in this country not only isolate the exciting cause, but reproduce the lesions, and thus the rheumatic heart is proved to be an infective process. From the date of this acquisition to our knowledge I hold that much teaching on the subject of heart disease has been entirely altered. So far as cardiac infections are concerned, we see at once that there are two phases—running of course, the one into the other—the active phase, in which everything ever to be gained in the way of cure must be sought for, and the stage of scar formation, in which palliative measures are only possible. Further, we realise that the study of heart disease is not, as would so often appear to be thought, a study of the heart alone, but a study of the response of the heart to infection, correlated with the responses of the other viscera.

It is often enough that the character of the infection, *quâ* virulence, determines the future of the patient rather than the particular physical signs at the moment. To estimate this virulence we must study not the heart alone but the patient. The life-history of the infection is of more cardiac importance than irregularities of action or valvular lesions. Why does the infection, in some cases, linger stubbornly on, breaking out at intervals, and producing in this way stenosis? Why do the valvular lesions sometimes fail to heal and thus produce various grades of malignancy? Again, why does the rheumatic infection in some cases damage the nervous mechanism of the heart, as in children it does the brain in chorea, thus producing intractable cardiac "neurasthenia"? How much can we influence the development and course of heart disease by more careful attention to angina faucium? What can we do to prevent scar formation by alteration of surroundings and more prolonged convalescence? When are we going to look upon scar formation as a failure in our methods and not as "heart disease"? These are problems with which what I venture to call the modern study of heart disease confronts us; these are the problems the solution of which, however imperfect, will lead to the relief of the human race from much affliction. Our text-books mostly begin at the end of the story, or perhaps it would be more correct to state that they lavish most of their wisdom on a lost cause. There are admittedly very many points in heart disease unassociated with infection, and I have nothing but admiration for the investigations connected with them, but I do claim that the establishment of cardiac infection in rheumatic heart disease is not only modern, but will eventually alter entirely the methods of description of many of the most important developments of heart disease.

I am, Sir, yours faithfully,

Devonshire-place, W., April 6th, 1917. F. JOHN POYNTON.

THE EXAMINATION OF THE BLOOD OF TYPHUS FEVER CASES BY DARK-GROUND ILLUMINATION.

To the Editor of THE LANCET.

SIR,—The infective agent in typhus fever has been a subject of much investigation in recent years. In Belfast we have made numerous blood cultures, but have failed to isolate any micro-organism which could be definitely incriminated as the cause of the disease. During the past few weeks we have had an opportunity (through the courtesy of Dr. Gardner Robb) of examining the blood of typhus fever patients with dark-ground illumination. Our investigations are yet far from complete, but the following facts seem worthy of putting on record.

1. In all cases examined before the crisis the blood shows a well-defined slender body which is about the thickness of the *B. typhosus* and, like the latter, is of variable length. This body is extremely pliable, wriggles, and shows distinct motility. In some cases its length is about 4μ, in others 6–8μ, and often a long slender filament about 16μ is seen. The clean-cut outline and the motility and the characteristic appearance indicate its parasitic character and differentiate it from any artefact. Whether it should be classed as a bacillus or spirochæte must be decided by further study. The appearance in the dark field is such as is presented by ordinary bacilli, but the longer forms are not unlike the straighter forms of the *Spirochæta ictero-hæmorrhagica*. Against the view that it is a bacillus is the fact that our cultures so far have been completely negative. It is remarkable that blood which contains numerous living forms of above description inoculated on all kinds of media both under aerobic and anaerobic conditions shows no growth. The micro-organism at each pole shows a highly refractile granule, and its slender pliant body differentiates it from the diphtheroid bacilli described by Plotz and others.

2. The micro-organism is free in the plasma. If the citrated plasma is centrifrugalised and the deposit examined in the dark field the presence of the germ is readily detected, but as a rule there is no difficulty in finding it without this procedure. Since the disease is transmitted by lice it is obvious that the virus must be present even in a small drop of blood.

3. The presence of above germs in blood which gives no growth on ordinary media is diagnostic of typhus fever.

4. So far we have examined blood from 12 separate cases of very different ages and in all have found the micro-organism. The day of the disease at which blood was examined varied from the fifth to fifteenth. During convalescence the germ could not be detected in several specimens, though it had been found at the acute stage.

In conclusion, we may state that a very careful examination of five specimens of normal blood showed no bodies at all resembling the above. We used Leitz's dark-ground condenser, 1/6 objective lens and 4 ocular, and as a source of illumination Mill's electric arc lamp. We need hardly add that slides, coverslips, &c., were scrupulously clean and sterile. In our opinion the micro-organism is closely related to the *Spirochæta ictero-hæmorrhagica* and to the bacillus found by Wolbach in Rocky Mountain fever, and pending further investigation might be described as the *Spirochæta typhi*.—We are, Sir, yours faithfully,

W. JAMES WILSON,
GEORGINA R. DARLING.

Hygiene and Public Health Laboratories, Queen's University, Belfast, April 6th, 1917.

THE CLOSURE OF COLOTOMY OPENINGS.

To the Editor of THE LANCET.

SIR,—In his letter in your issue of April 7th Mr. Lockhart-Mummery still maintains that the enterotome method of closing a colotomy opening is the best. He objects to the method of Greig Smith on the ground that—

"The extraperitoneal operation is very liable to leave a weak place in the abdominal wall, and many patients have subsequently to wear belts. It also leaves a condition which is not normal and is liable to cause trouble later."

In his paper in your issue of March 10th, in discussing the enterotome method, he states:

"The only objection to it is that the condition left is not quite normal, as the bowel remains attached to the abdominal wall, and there is often a weak spot which may necessitate the wearing of a belt or support."

Wherein lies the difference?

I have seen no trouble subsequent to the extraperitoneal operation. Mr. Lockhart-Mummery condemns the extraperitoneal method as being dead, but in doing so condemns his enterotome method. He wrote his paper feeling that as surgeon to St. Mark's Hospital he should call the attention of the uninitiated to the best method of closing colotomy openings. The enterotome method he regards as "the easier and by far the safer" when compared with the resection method. He must admit the same for the extraperitoneal method, as from his own statements he has no more objection to it than he has to the enterotome method.

His paper was also written to describe "(1) the easiest and (2) the best methods of closing a colotomy." A third object might have been the safest method. The statistics given by him show by his methods 14 per cent. deaths and 16·6 per cent. failures after repeated operations. The figures I gave in my letter of March 31st show for the extraperitoneal method 2·6 deaths and no failures. I think that even Mr. Lockhart-Mummery should agree that the extraperitoneal method is the one to be adopted by the less initiated, the resection method being kept for the unusual case and the enterotome put into the museum.

A point which has not apparently been made clear is, that there must be adequate clearing of the bowel before the opening is closed. If this is done, what can be the object of having the bowels opened on the second day? It will cause undue tension on the sutures. There are no masses of hard fæces in the bowel. Even if there were hard masses of fæces present due to faulty preparation, then a small enema or small doses of salts will not break them up, The stimulus will only cause them to come into the neighbourhood of the sutures, a condition of things which, I agree with Mr. Lockhart-Mummery, is to be avoided at all costs. In my opinion, routine opening of the bowel on the second day will cause failure in the closing of colotomy openings.

I am, Sir, yours faithfully,

ERNEST FINCH, M.D., M.S. Lond., F.R.C.S. Eng.,
April 9th, 1917. Assistant Surgeon, Royal Infirmary, Sheffield.

TUBERCULOSIS AND THE WAR.

To the Editor of THE LANCET.

SIR,—In reply to Dr. Edward E. Prest's letter in THE LANCET of March 24th, as a believer that a good deal of the trouble in the comparison of tuberculous cases is due to the inexact use of terms, I should be glad to know what he means by "that he may be permanently cured," and how the condition is recognised when it is attained, as after much inquiry I have up to date failed to find a satisfactory description of how it may be achieved and recognised.

In connexion with his desire to give five months' treatment in a sanatorium to cases classified as Class I., I may state that I have had two cases sent to my sanatorium this week from the Army which illustrate the point. One patient came from India; there was T.B. bacillus found in the sputum months ago, when his condition of health was very low. He is now his normal weight, he has no temperature variation (taken rectally), no increase of pulse-rate, no cough, no sputum; desires and is quite capable of working after a short holiday. Should I send him to "a properly conducted sanatorium"? The other case was discharged from my sanatorium 20 months ago, apparently all active symptoms having subsided and in excellent health. He has now been returned from France after 12 months' service, 1 stone heavier than when he left, with no cough, no sputum, no increase in pulse-rate, and no variation of temperature He is much amused at his success in getting his discharge and pension. He is a very efficient "swinger of the lead," as I know from experience, and he will remain in the sanatorium as long as we are willing to keep him, and would thoroughly enjoy "five months' treatment."

I fully believe in sending Class I. cases into a sanatorium if they show any loss of resistance during dispensary attendance; in fact, very few others are admitted here except soldiers' dependents or cases forwarded by the War Office; but from watching a considerable number of cases (about 2000) I am satisfied that there is a stage anterior to that requiring the complete cessation of wage-earning, which the sanatorium treatment necessitates. Any threat to their resistance by the tubercle organism can be countered without turning them into invalids, even temporarily. This stage takes a certain amount of care in recognising, and is generally classified as incipient phthisis. When a sanatorium is indicated the lesion has usually become more definite, and permanent tissue destruction has occurred, as is demonstrated by the physical signs of the grosser nature easily recognised by the ordinary stethoscope.

More than 50 per cent. of the cases that have been passed through the sanatorium here in the last two years are in full work, many for a considerable time, without deterioration. Still, I should hesitate to describe them "as permanently cured," and it is considered advisable that they should still attend the dispensary occasionally for observation and advice.

I am, Sir, yours faithfully,

Middlesbrough, April 4th, 1917. HENRY A. ELLIS.

READING BY EAR.

To the Editor of THE LANCET.

SIR,—Will you permit me to point out that the article in the *Times* of March 29th describing a recent trial of the optophone was of a somewhat misleading character. On Jan. 25th Dr. d'Albe undertook to give a demonstration of the practical value of the optophone before some experts of the National Institute for the Blind, this demonstration to consist of the reading of newspaper type at the rate of 25 words a minute. It was deferred until Dr. d'Albe had practised to a degree which he considered sufficient on the instrument to be employed. Dr. d'Albe selected March 26th as the date, and I have it from him that he had practised 130 hours on the optophone used.

As to how far short he fell of his expectations the following extract from a report submitted to me by the four experts of the National Institute for the Blind who attended the demonstration, and two of whom were blind men, will show.

The speed which the inventor was able to attain—one word in one minute and a quarter—would be utterly useless. Dr. d'Albe's contention that increased speed was purely a question of practice is not convincing, for our knowledge of the optophone leads us to believe that the speed must always be so slow and the use of the instrument so nerve-racking as to make the optophone of little or no value to blind people, whatever may be its use in other directions. But even assuming that a satisfactory speed could be obtained, the expensive character of the instrument would put it out of the reach of the average blind person.

I hope that Dr. d'Albe will now cease to issue misleading statements with regard to the practical value of the optophone as a means of enabling blind people to read. It can at present be only described as an interesting scientific toy. It is to be most sincerely hoped that Dr. d'Albe will in the course of time succeed in producing results from his ingenious invention which will render it worthy of serious consideration by those who have the interests of the blind at heart. I am, Sir, yours faithfully,

ARTHUR PEARSON,
President, National Institute for the Blind.
Great Portland-street, London, W., April 2nd, 1917.

*** We noted on Feb. 17th Dr. d'Albe's demonstration of the optophone at the Röntgen Ray Society and his claim that with practice printed type could be read at the rate of several words a minute. This claim he appears to have failed to establish.—ED. L.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Wounded.

Major J. S. Jenkins, Canadian A.M.C.
Capt. A. Peden, R.A.M.C.
Capt. P. R. Bolus, R.A.M.C.
Capt. J. G. Greenfield, R.A.M.C., attached Cameronians.
Capt. G. F. Hardy, M.C., R.A.M.C., attached Royal Garrison Artillery.
Capt. J. Hardie, Australian A.M.C.
Capt. F. R. Sturridge, R.A.M.C., attached Royal Sussex Regiment.
Capt. J. A. R. Wells, R.A.M.C., attached Lancashire Fusiliers.
Capt. V. E. Badcock, R.A.M.C., attached Highland Light Infantry.
Capt. C. H. Fischel, R.A.M.C., attached Royal Field Artillery.
Capt. R. P. Rosser, R.A.M.C.
Capt. A. A. Rutherford, R.A.M.C.

Missing.

Capt. S. J. Linzell, R.A.M.C.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war :—

Second Lieut. R. B. W. Gosse, Cheshire Regiment, attached Royal Warwick Regiment, second son of Dr. H. W. Gosse, of Eccleshall, Staffs.
Lieut. F. C. Woods, Royal West Surrey Regiment, younger son of the late Surgeon-Major Woods, A.M.S.

MENTIONED FOR WAR SERVICES.

The name of the following medical officers are to be added to the list given in THE LANCET of March 3rd, p. 353 :—

Temp. Col. J. Atkins, C.M.G., A.M.S.; Temp. Capt. W. T. Finlayson, R.A.M.C.; Surg. Lt.-Col. and Hon. Surg.-Col. D. Hepburn, R.A.M.C.; Major (temp. Lt.-Col.) G. S. Mansfield, Reserve of Officers, R.A.M.C.; Temp. Capt. C. R. Stewart, R.A.M.C.; Temp. Major R. H. Swan, R.A.M.C.; Major and Bt.-Lt.-Col. C. R. Sylvester-Bradley, R.A.M.C.; Temp. Capt. D. J. Thomas, R.A.M.C.; Lt.-Col. F. H. Westmacott, R.A.M.C.

The following corrections in the list given in THE LANCET of March 3rd are announced :—

For Lt.-Col. J. Battersby read Lt.-Col. H. L. Battersby; for Maj. E. Grey read Maj. E. Gray; for Maj. J. H. H. Pirie read Maj. W. R. Pirie; for Davies, Temp. Capt. F. J. P., read Daly, Temp. Capt. F. J. P.

THE CENTRAL MEDICAL WAR COMMITTEE: THE SUPPLY OF MEDICAL OFFICERS FOR THE ARMY.

At a meeting of the Central Medical War Committee, held on Wednesday, April 11th, a report by the Assessment Subcommittee was read, showing how it was proposed to meet the demands of the War Office for further medical officers.

The report stated the position was as follows—that of the number of medical officers required by the War Office by May 31st, some 250 men were still wanting, and that, as the first step towards making up this deficit, it had been decided to include in a further call men between 41 and 45, men passed for home service only, and men who, having served with the Army, have returned to civil practice for not less than one year, this being in addition to any men under 41 who could still be spared from the districts in which they practised.

The Assessment Subcommittee proceeded by dividing all the material possibly available into three groups—namely, areas which cannot under existing circumstances supply more medical men; areas in which it is not possible to say that this disability definitely exists; and, lastly, areas on which a call can be made immediately. Under this third group were included those areas and sub-areas in which more medical men are now available by an increase in their number since the last call was made, or by the raising of the age-limit. Having made careful analysis of the sources of supply in minute detail, the Assessment Subcommittee, in the report, considered that the new call which it proposed would make good the estimated deficit in the number of medical officers demanded by the War Office by May 31st.

The report of the Subcommittee, after debate, was approved in a resolution of the following terms :—

1. That the Committee approves the report of the Assessment Subcommittee as to the prospects of meeting the requirements of the War Office for May 31st, and authorises calls to be made forthwith in accordance therewith. 2. That on the facts ascertained from the critical review now made of the remaining provision for the civil community the Committee records its opinion that no further substantial reduction in the number of doctors in civil practice can be effected without such public dissatisfaction as, in the opinion of the Committee, should not be occasioned on its sole responsibility; it therefore deems it its duty to place the position before the Government through the departments with which it is chiefly brought into relation—namely, the War Office, the Local Government Board, and the Insurance Commission.

At a recent meeting of the Executive Committee of the Wandsworth Division of the British Medical Association, a resolution was unanimously carried protesting against any measure of compulsion being applied to the medical profession which is not at the same time applicable to the whole community.

THE MEDICAL SERVICE OF THE UNITED STATES NAVY.

America's momentous decision to take a part in the war gives special interest to an illustrated article dealing with the United States Naval Medical Service which appeared in the *New York Medical Journal* of March 17th. Before the passing of the Act of August 29th, 1916, which provided for a large increase in the personnel, the Medical Corps of the United States Navy consisted of 345 medical officers. The full complement is now 683 and there are stated to be about 300 vacancies. The limits of age for appointment are 21 to 32 years, and, as in our own naval service, candidates have to pass both a physical and a professional examination. No candidate is accepted unless his physical condition warrants an expectation of active service until the retiring age of 64 years, when he receives two-thirds of the pay of his grade. The professional examination is divided into two parts, the first being for enrolment in the Naval Reserve Force. If successful the candidate attends a course of instruction at the Naval Medical School on full pay and allowances, upon the completion of which he takes the final examination for appointment in the Medical Corps of the Navy. The pay of an assistant surgeon on shore duty is $2000 per annum with quarters, or, when quarters are not supplied by the Government, an additional allowance for quarters amounting to $432. At sea the assistant surgeon receives $2200, his quarters and attendance being furnished him aboard his ship. Every five years the pay of an officer increases by 10 per cent., although the increment cannot exceed 40 per cent., calculated on the annual base pay of his grade. The pay of a medical director with the rank of captain is thus limited to $5000, that of a medical inspector with the rank of commander to $4500, and that of surgeon with the rank of lieutenant commander to $4000. The pay of a medical director with the rank of a rear-admiral is $6000 for the lower half and $8000 for the upper half of those in that grade.

In addition to the regular Naval Corps there is a medical division of the Naval Reserve Force which requires 500 surgeons, membership being open to all medical men under 44 years of age who are American citizens. A member receives two months' retaining pay for every year of his enrolment, in addition to service pay for any term of actual service which he may give, the pay corresponding to that for similar ranks in the Navy. Members who re-enrol for four years, subject to certain conditions, receive an increase of 25 per cent. of their base retaining pay. After 20 years' service an officer may be retired on his own application, with a cash credit equal in amount to his retaining pay during the last term of enrolment. In order to meet the need for rapidly training reserve officers in the duties of medical recruiting during mobilisation a correspondence course has been established at the Naval Medical School, Washington, D.C.

MEDICAL ARRANGEMENTS IN VOLUNTEER BATTALIONS.—A question addressed to the Under Secretary of State for War last week in the House of Commons elicited the fact that the appointment of medical officers to volunteer battalions has been sanctioned by the War Office. It has not yet proved possible to proceed with the formation

of volunteer field ambulances, owing to changes of organisation consequent on the passage of the Volunteer Act. Proposals were, however, under consideration, and Mr. Macpherson hoped that the matter would shortly be settled.

THE ARMY DOCTOR'S RISKS.—In the House of Lords last week, when the Military Service (Review of Exceptions) Bill was read a third time and passed, Lord Derby said it was impossible to set up medical appeal boards all over the country, as was asked for in the House of Commons, because there were not sufficient doctors to do the work. Some people, he said, thought that the work of the Royal Army Medical Corps was free from danger, but, as a matter of fact, the Army lost more than 400 doctors killed and wounded in the Somme battle alone. At the present moment, he added, the Army was not critically, but certainly lamentably, short of doctors.

Medical News.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Second Professional Examination of the Conjoint Board in Anatomy and Physiology, held on March 28th and 29th and April 2nd, 52 candidates presented themselves, of whom 30 were approved and 22 were rejected. The following are the names of the successful candidates:—

Hussein Amin, Cairo and Guy's Hospital; Henry Edwards Archer, St. Bartholomew's Hospital; Arthur Beadblock, University College; Benjamin Faltas Behman, Assiut and King's College; Anna Bridget Broman, London School of Medicine for Women; Harold Mallows Brown, Guy's Hospital; Marjorie Carnsew Chappel, London School of Medicine for Women; Alice Maud Mary Clegg, Liverpool University; Saul Cohen, Guy's Hospital; Redgewell George Dansie, King's College; Thomas Draper, Edinburgh; Henry Dryerre, Royal Colleges, Edinburgh; Abdel Hamid El Rakshi, Cairo and King's College; Edwin Spencer Etheridge, University College; Gerald Hartas FitzGerald, Guy's Hospital; Herman Meyer Gerson, London Hospital; Wahba Girgis, St. Mary's Hospital; Harry Cunliffe Hopkinson, Cambridge and Manchester Universities and Middlesex Hospital; Aga Mohamed Kazim, Bombay University and Madras Medical College; Henry David Kelf, St. Bartholomew's Hospital; Frederick Charles Lewis, Liverpool University; Edgar Duncan Macmillan, St. Bartholomew's Hospital; Syed Francis Mahmood, Cardiff and St. Bartholomew's Hospital; Anna Miller, London School of Medicine for Women; George Geoffrey Newman, London Hospital; Arthur Samuel Pearson, Birmingham University; Guy Kingham Reeves, Guy's Hospital; Benn Roland Reynolds, University College, Cardiff; and Gerald Maurice Joseph Slot and William Gilbert Desmond Harold Urwick, St. Bartholomew's Hospital.

UNIVERSITY OF LONDON.—At examinations for internal and external students held recently the following candidates were successful:—

SECOND EXAMINATION FOR MEDICAL DEGREES, PART I.

Dulcie Stapleton Adkins and Doris Elizabeth Alcock, London School of Medicine for Women; Christopher Howard Andrewes, St. Bartholomew's Hospital; Marjorie Henrietta S. Auden, Frances Sophia Barry, and Geraldine Mary Barry, London School of Medicine for Women; Davis Evan Bedford, Middlesex Hospital; Percy Croad Brett, St. Mary's Hospital; John Laird McKenzie Brown, St. Bartholomew's Hospital; Margaret Minna Brownstone, London, School of Medicine for Women; *Maurice Danks Cadman, St. Thomas's Hospital; Frederick Cecil Wray Capps, St. Bartholomew's Hospital; Joan Katherine Somerville Cave, London School of Medicine for Women; George William Chester, King's College; Anaple Frances Mary Christie, London School of Medicine for Women; John Joseph Coghlan, London Hospital; Joseph Alfred Cohen, King's College; Julius Cohen, St. Mary's Hospital; Henry Nathan Warner Collins, King's College; Nancy Macnaughton Coutts, Elsie Eleanor Cowperthwaite, and Barbara Cubitt, London School of Medicine for Women; Godfried Leon Jozef A. De Rynck, University College; Edith Monica Down, London School of Medicine for Women; Nicholas Bernard Dreyer, Guy's Hospital; Archibald Glen Duncan, London Hospital; Edith Marian Evans and Ada Marion Freeman, London School of Medicine for Women; Arthur John Gardham, University College; Janet Katharine Gatty and Madeline Giles, London School of Medicine for Women; Humphrey Hart Gleave, University of Leeds; Kate Glyn-Jones, London School of Medicine for Women; Brian Wilson Barnett Gordon, St. Mary's Hospital; Eleanor Graham, London School of Medicine for Women; Nellie Gray, King's College; Katharine May Harbord and Gertrude Eleanor Harre, London School of Medicine for Women; Martin Curgenven Hartley, London Hospital; Majorie Christina Hawkins, University College, Cardiff; Hilda May Haythornthwaite and Phyllis Mary Horton, London School of Medicine for Women; Margaret Olwen Howell, University College, Cardiff; Margery Kathleen Illingworth and Doris Eleanor Parker Jolly, London School of Medicine for Women; David John Jones and Dilys Menai Jones, University College, Cardiff; Dorothy Maud Kemp and Kathleen Helena Beatrice King, London School of Medicine for Women; William Edward Kappel Kirby, University College; *Joseph Victor Landau, St. Bartholomew's Hospital; Geraldine Zarita Lee Le Bas, Bedford College; Margaret Longbottom, London School of Medicine for Women; Rupert Alexander Madgwick, London Hospital; Montague Maizels, University College; Iva Clare Marion Molony and Eva Joyce Newton, London School of Medicine for Women; Bertram Sydney Nissé, London Hospital; Sybil Mary Nuttall, Helen O'Brien, and Alice Owen, London School of Medicine for Women; Charles Frederic Parry, Rupert John Parry, and Thomas Parry, University College, Cardiff; Louise Olivia Paterson and Winifred Peacey, London School of Medicine for Women; Norman August Marais, London Hospital; Phœbe Myfanwy Phillips, Evelyn Violet Pilley, Tressila Laura Pires, Alice Dorothy Pocock, and Cassie Ethel Pratt, London School of Medicine for Women; Charles Arnold Probert, private study; Louise Agnes Proctor and Hilda Winifred Richards, London School of Medicine for Women; Philip Lawrence Richardson, Guy's Hospital; Isabella McDougall Robertson, London School of Medicine for Women; William George Rose, St. Mary's Hospital; May Kathleen Ruddy and Maud Sanderson, London School of Medicine for Women; John St. Clair Shadwell, Guy's Hospital; Abraham Isaac Silverman, Middlesex Hospital; Elfrida Elizabeth Ada Spencer, B.A., London School of Medicine for Women; Harold Edwin Thomas, University College; Frederick Henry Wickham Tozer and Mark Tree, London Hospital; Doris Lyne Veale, Norah Walden, Gladys May Watkinson, Agnes Edie Westwood, Agnes Sidney Wilkins, and Ada Kathleen Williams, London School of Medicine for Women; Samson Wright, Middlesex Hospital; Jacob Elias Zeitlin, London Hospital; Michael Israel Zimmerman, King's College.

* Awarded a mark of distinction.

N.B.—This list, published for the convenience of candidates, is issued subject to its approval by the Senate.

UNIVERSITY OF DURHAM: FACULTY OF MEDICINE.—At the Convocation held on March 31st the following degrees were conferred:—

Doctor of Medicine.—Idris David Evans and Robert Peart.

Bachelor of Medicine (*M.B.*).—Norman Braithwaite, Ernest Bramley, Richard Vere Brew, Stephanie Patricia Laline Hunte Taylour Daniel, Donald Henegan, James Dixon Johnson, John Kerr Ritchie Landells, Kamel Ibrahim Shalaby, Charles Rees Smith, and Iskander Soliman.

Bachelor of Surgery (*B.S.*).—Norman Braithwaite, Ernest Bramley, Richard Vere Brew, Horace George Bennett Dove, Donald Henegan, John Kerr Ritchie Landells, Kamel Ibrahim Shalaby, and Charles Rees Smith.

The following received the Diploma in Public Health (D.P.H.):—

Richard Julius Cyriax and Douglas Catterall Leyland Orton.

The following received the Licence in Dental Surgery (L.D.S.):—

Wilfred Phillipson Spence.

THROUGH a decision of their Joint Matriculation Board the Universities of Manchester, Liverpool, Leeds, Sheffield, and Birmingham have now come into line with other examining bodies in not requiring that Latin should be taken as an obligatory subject in the entrance examination to the Faculty of Medicine.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An extraordinary Comitia of the College was held on April 2nd. Dr. Frederick Taylor, the President, occupied the chair and delivered the presidential address, in the course of which he first mentioned the changes in the College list, among them that the College had lost by death during the year 6 Fellows, 8 Members, 1 Extra-licentiate, and 195 Licentiates. Among the 8 Members was the senior Member, Dr. Horace B. Dobell, who founded the lecture which bears his name. A long and interesting list of honours, military and civil, conferred upon Fellows, Members, and Licentiates of the College was then read out, after which the lectures delivered during the past year were mentioned—namely, the Harveian Oration, by Sir Thomas Barlow; the Bradshaw Lecture, by Dr. H. W. G. Mackenzie; the FitzPatrick Lectures, by Dr. W. H. R. Rivers; the Horace Dobell Lecture, by Dr. H. R. Dean; the Lumleian Lectures, by Dr. G. A. Sutherland; the Goulstonian Lectures, by Dr. C. H. Miller; and the Oliver-Sharpey Lecture, by Dr. C. Bolton. The medals and scholarships awarded were next referred to, the fact that there were no candidates for the Murchison scholarship being announced. After reviewing the principal matters which had come before the President, the Comitia, and the various boards and committees, the President read obituary notices of the six Fellows who had died during the year—namely, Sir Lauder Brunton, Bart., Dr. William Orange, C.B., Dr. Duncan Burgess, Dr. W. W. H. Tate, Dr. William Cayley and Sir James F. Goodhart, Bart. A ballot was taken for the office of President, and Dr. Taylor was re-elected. After some formal business the Comitia was dissolved.

ROYAL INSTITUTE OF PUBLIC HEALTH.—A second course of lectures and discussions on "Public Health Problems under War and After-war Conditions" will be held in the lecture hall of the Institute on Wednesdays from April 18th to July 25th inclusive, at 4 P.M. The lectures range over a large area of immediately pressing topics, each of which is to be dealt with by an acknowledged expert, and discussion will follow the delivery of the lecture. Medical officers of health, medical practitioners, sanitarians, and others engaged in public health work are invited to attend. A syllabus of the course may be obtained on application to the secretary, 37, Russell-square, London, W.C. 1.

METROPOLITAN ASYLUMS BOARD: DIPLOMA IN PUBLIC HEALTH.—A course of lectures and demonstrations (lasting three months) in hospital administration will be given at the North-Western Hospital, Lawn-road, Hampstead, London, N.W., by Dr. J. E. Beggs, medical superintendent, on Tuesdays and Fridays at 5 P.M., beginning Tuesday, May 8th. The fee for the course is £3 3s., and further particulars may be obtained from the Clerk to the Metropolitan Asylums Board, Embankment, London, E.C.4.

INSTITUTE OF HYGIENE.—The Principal of the Institute, Mr. J. Grant Ramsay, delivered on March 29th a lecture on "The Problem of Food, Fitness and National Resources." Proper feeding was, he said, the foundation of fitness. He had come across strong healthy people in the worst slums of Europe, but always found that they were well fed; he had never met or heard of healthy people, even living in the best surroundings, who were badly fed. Proper feeding, however, did not necessarily mean high feeding or large feeding; it meant eating the right foods, in the right quantity, at the right time, and in the right way. Halliburton had advocated the eating of rather more than was actually essential, while Chittenden believed we were healthier with rather less than the accepted standard. Nature was very accommodating, and there was much to be said for both theories, but we had followed Halliburton so long that we could now afford to give Chittenden a chance. Those who could afford to do so should continue to buy the best foods and the best parts, leaving the food of the poor as far as possible to the poor, who were more influenced by habit, and would continue to buy what they had been accustomed to.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BENNETT, JAMES, M.R.C.S., L.R.C.P.Lond., D.P.H., has been appointed Medical Officer of Health to the Runcorn Rural District Council.

CLARKE, A. E., M.D. Lond., Certifying Surgeon under the Factory and Workshop Acts for Rickmansworth.

MACKENZIE, J. J. R., M.B., Ch.B. Edin., Certifying Surgeon under the Factory and Workshop Acts for Wansford, Northampton.

MOGG, J. A. H., L.R.C.P. & S. Edin., L.F.P.S. Glasg., Certifying Surgeon under the Factory and Workshop Acts for Woodstock.

NAISH, LUCY, M.B. Lond., Lady Tutor in Anatomy, *vice* Dr. Sophia Witts, resigned, in the University of Sheffield.

OUTRED, C. D., M.R.C.S., L.R.C.P. Lond., Certifying Surgeon under the Factory and Workshop Acts for Gravesend District.

ROSS, H., Certifying Surgeon under the Factory Act for the City of London, *vice* E. S. Mair.

SELLERS, W. H. I., M.B., C.M. Edin., M.R.C.S., to be one of the Medical Referees under the Workmen's Compensation Act, 1906, for County Court Circuit No. 4.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BARROW-IN-FURNESS, NORTH LONSDALE HOSPITAL.—House Surgeon. Salary £250 per annum, with board, &c.

BATH, EASTERN DISPENSARY.—Resident Medical Officer. Salary £140 per annum, with furnished rooms, &c.

BODMIN, CORNWALL COUNTY ASYLUM.—Female Junior Assistant Medical Officer. Salary £200 per annum, with board, &c.

BOLTON INFIRMARY AND DISPENSARY.—Second House Surgeon. Salary £200 per annum, with board, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Surgeon. Salary £160 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURNLEY, VICTORIA HOSPITAL.—House Surgeon. Salary £160 per annum, with board, &c.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

CHARING CROSS HOSPITAL, Agar-street, W.C.—House Physician and House Surgeon. Salaries £100 per annum, with board, &c.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—House Surgeon. Salary £200 per annum, with board, &c.

CHICHESTER, ROYAL WEST SUSSEX HOSPITAL.—House Surgeon. Salary at rate of £150, and War Bonus at rate of £50 per annum, with board, &c.

GREAT NORTHERN CENTRAL HOSPITAL, Holloway-road, N.—Resident Medical Officer. Salary £200 per annum, with board, &c.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

HUDDERSFIELD, STORTHES HALL ASYLUM, Kirkburton, near Huddersfield.—Locum Tenens. Salary £7 7s. per week, with board, &c.

LEEDS PUBLIC DISPENSARY.—Second Female Resident Medical Officer. Salary £200 per annum, with board, &c.

LIVERPOOL, BROWNLOW HILL INSTITUTION.—Resident Assistant Medical Officer. Salary at rate of £300 per annum, with rations, &c.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. 1.—Temporary Anæsthetist. Salary 25 guineas per annum.

MAIDSTONE, WEST KENT GENERAL HOSPITAL.—Assistant House Surgeon. Salary £125 per annum, with board, &c.

MANCHESTER, ANCOATS HOSPITAL.—House Physician. Salary £150 per annum, with board, &c.

MANCHESTER COUNTY ASYLUM, Prestwich.—Locum Tenens. Salary £7 7s. per week, with board, &c.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—House Surgeon. Salary £150 per annum, with board, &c.

NETLEY, WELSH HOSPITAL.—Medical Officer for Pathological Department. Salary £400 per annum, with board, &c.

NORTHAMPTON GENERAL HOSPITAL.—House Surgeon. Salary £150 per annum, with board, &c.

NOTTINGHAM, NOTTS EDUCATION COMMITTEE.—Female Assistant School Medical Officer. Salary £300 per annum.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.—House Surgeon.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician, Casualty House Surgeon, and House Surgeon for six months. Salary £100 per annum, with board, &c.

READING, ROYAL BERKSHIRE HOSPITAL.—Resident Clinical Assistant for six months. Salary £150, with board, &c.

ROTHERHAM HOSPITAL.—Junior House Surgeon. Salary £150 per annum, with board, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Examiners.

ST. PETER'S HOSPITAL FOR STONE, ETC., Henrietta-street, Covent Garden, W.C.—Junior House Surgeon for six months. Salary at rate of £75 per annum, with board, &c. Also Junior Anæsthetist.

SERBIAN RELIEF FUND, 5, Cromwell-road, London, S.W. 7.—Medecin Chef to Hospital on Salonica Front.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SHREWSBURY, SHIRLETT SANATORIUM, Shropshire.—Temporary Assistant Resident Medical Superintendent. Salary £300 per annum.

WEST BROMWICH AND DISTRICT HOSPITAL.—Assistant House Surgeon. Salary £120 per annum, with board, &c.

WHITEHAVEN AND WEST CUMBERLAND INFIRMARY.—Resident House Surgeon. Salary £150 per annum, with board, &c.

WINCHESTER, ROYAL HAMPSHIRE COUNTY HOSPITAL.—Female Assistant Resident Medical Officer. Salary £250 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Brynamman and Bishop's Waltham.

Births, Marriages, and Deaths.

BIRTHS.

DOBRASHIAN.—On April 6th, at Oakley-square, N.W., the wife of Lieutenant G. Rowland Dobrashian, R.A.M.C., of a son.

HALLOWS.—On April 5th, at Gloucester-gate, Regent's Park, Mary, wife of Captain Norman F. Hallows, R.A.M.C., of a son.

KIDD.—On April 4th, at Harley-street, London, the wife of Frank Kidd, F.R.C.S., of a son.

PENNELL.—On April 2nd, at Winchmore Hill, N., the wife of Vernon Pennell, M.A., M.B., B.C. Cantab.—a son.

PINSON.—On April 5th, at Stockport-road, Cheadle, the wife of K. B. Pinson, M.B., M.R.C.S., of a daughter.

PRINGLE.—On March 30th, at Glaslyn Crescent-road, Ipswich, Jessie Eva (*née* Hart), M.B., B.S., the wife of Arthur Young Pringle, M.R.C.S., L.R.C.P., of a son.

RAINEY.—At Wakefield House, Eastbourne, the wife of Captain E. H. Rainey, R.A.M.C., of a daughter.

WEBB.—On April 4th, at Grosvenor-square, Southampton, the wife of Captain G. Harvey D. Webb, R.A.M.C., of a son.

MARRIAGES.

CARDEW—GRAEME MARSHALL.—On April 4th, at the Parish Church, Cheltenham, Arthur Barrett Cardew, M.C., F.R.C.S., R.A.M.C., of Overbury, Charlton Kings, to Nora Graeme Marshall, second daughter of the late James Marshall, of Hillhead, Glasgow.

FRASER—MELLOR.—On March 27th, at the Parish Church, Ashton-under-Lyne, Thomas Lochhead Fraser, Captain, R.A.M.C., to Dorothy Walton, only child of the late Mr. A. E. Mellor, J.P., of Springfield View, Ashton-under-Lyne.

KERBY—LEMAN.—On April 5th, at St. Mary's, Strand, by the Rev. Harcourt Hillersdon, Surgeon T. R. F. Kerby, R.N., to Lilian, only daughter of D. Jackson Leman, of Westbourne-terrace, W.

MORGAN-REED.—On March 30th, at Valparaiso, H. Lewis Morgan, F.R.C.S., to Minnie, daughter of Mr. and Mrs. Wm. Reed, Stockton on Tees.

PEARSE—WILBURN.—On March 30th, at St. Saviour's Church, Colgate, Captain Robin Pearse, F.R.C.S., C.A.M.C., of Toronto, to Amy Christine, eldest daughter of Mr. and Mrs. E. J. Wilburn, The Croft, Southwick.

DEATHS.

BARKER.—On April 5th, Henry Martyn Barker, M.D., of "Stainciff," Sandown, Isle of Wight.

BOULT.—On Palm Sunday, at St. Margaret's-terrace, St. Leonard's-on-Sea, Edmund Farrington Boult, Surgeon-Major, R.A.M.C. (retired), eldest son of the late Edmund Boult, F.R.C.S., of Bath.

JOY.—On April 1st, at the Manor House, Tamworth, Staffs, Charles H. Joy, M.D., aged 46 years.

MARR.—On Feb. 19th, at Bhusawal, India, of enteric, James Marr, M.B., C.M., District Surgeon, G.I.P. Railway, aged 47 years.

POTTER.—On April 9th, suddenly, Henry Percy Potter, M.D., F.R.C.S., for 37 years Medical Superintendent of Kensington Infirmary, in his 63rd year.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

MEDICAL NOTES IN HISTORICAL MANUSCRIPTS: THE STUART PAPERS.

FOLLOWING are some further excerpts from Part VI. of the Stuart Papers. The first instalment appeared in THE LANCET of April 7th, p. 558.

Death of Queen Mary.

The Earl of Panmure to the Duke of Mar.—1718, May 9, Paris.—"The Queen was taken ill on Sunday the 1st, which I did not know till Monday evening, so I went to St. Germains Tuesday morning and Dr. Blair went with me. They told us there that the Queen was better and that they did not think her in any danger. Dr. Blair did not then see her nor was his advice asked, but on Saturday morning an express came for him, so he went to St. Germains in all haste, but found her speechless, and past all hopes of recovery, for she died about two hours after. I'm told that Dr. Garvan and the King of France's physicians thought she was in no danger the night before and were resolved to have given her physic the next day, but I will not enlarge on so melancholy a subject."

Father Gaillard, the Queen's Confessor, to James III.—1718, May 9, St. Germains.—"Il s'agit de vous instruire en detail pour votre consolation premièrement de ce qui s'est passe dans cette sainte mort et secondement de ce qui vous y regarde personnellement par les sentimens que la Reyne m'a marqués a vostre égard et par tout ce qu'elle ma chargé de vous ecrire. Premier article de ce qui c'est passe à la mort de la Reyne: Il y avoit quelque temps environ un mois que la Reyne avoit esté attaquée d'un rhûme qui disparoissoit quelquefois, et qui de temps en temps sa renouvelloit n'estant pas toutafait gueri. La Reyne se portoit assez bien le dimanche, premier jour de may, feste de St. Jaques et St. Phillippe. C'estoit le jour qu'elle avoit choisi pour remplir l'heure de son adoration devant le St. Sacrement, s'estant associée a la confrairie de parroisse de St. Germain. Sa Majesté se rendit pour cela a l'eglise de la parroisse cinq heures du dimanche apres disner ayant fait ses devotions a l'ordinaire le matin dans sa chapelle et y ayant recité le rosaire a quatre heures a la maniere accoutumée. Le St. Sacrement fut exposé à la parroisse des que la Reyne y fut arrivée un peu avant cinq heures. La Reyne commenca son adoration à genoux où elle se tint pendant une demiheure, et fut assisse sur ses jambes la demiheure suivante, n'ayant pas voulu s'asseoir sur son fauteuil qui luy estoit preparé. L'heure de l'adoration finie, le salut fut commencé à six heures, auquel elle assista à genoux. En suite elle monta dans son carrosse pour s'aller promener sur la terrasse ou elle sentit du froid. C'est ce qui la fit retourner apres demiheure de promenade sans pourtant s'estre trouvée incommodée, car elle soupa ce soir la avec plus d'appetit qu'elle n'avoit fait depuis longtemps. Elle sa coucha a l'heure ordinaire, mais elle passa assez mal la nuit jusqu'a cinq heures du matin du lundy qu'elle fut saisie du frisson de la fievre qui dura une heure, ce qui fut suivi de la chaleur. C'est ce qui fut compté pour peu de chose. Je fus apellé et j'eus l'honneur de s'entretenir selon tous les sentimens de sa pieté. Cette fievre n'a point cessé jusqu'au dernier jour de sa mort, elle parût plus considerable par les redoublemens qui survenoient, l'un le matin plus leger, l'autre sur les quatre heures de l'apres disner, qui commençoit par une toux assez violente, c'est ce qui a duré jusqu'au dernier jour. La nouvelle de cette maladie ayant esté seeüe à Paris, Monseigneur le Mareschal de Villeroy par son zele très vif et très fidelle par la Reyne me fit l'honneur de m'ecrire pour offrir à la Reyne les medecins de la cour, qu'elle souhaiteroit Sa Majesté demanda Monsieur Dodart, aujourd'huy premier medicin du roy, et Monsieur Boudin. Ce sont les deux qui la traittement dans sa grande maladie dernière. Ces medecins sont venus tous les jours depuis mardy jusqu'au vendredy, veille de la mort. D'abort ils ne trouverent rien de mortel dans cette fievre, ils ordonnerent une second saignée, la premiere ayant esté faite des le lundy par l'ordre de Mr. le chevalier Garven. Cette suite de redoublements et de toux les a embarrassés, mais ils n'en ont pas paru trop alarmés. Le mercredy et jeudy se passerent de mesme facon et mesme la nuit du jeudy au vendredy fut si bonne qu'on commenca à mieux esperer et mesmes on ordonna une medicine pour le lendemain, same ty. Pendant tout le temps la j'ay rendu mes assidu'tés à la reyne, la messe tous les jours, et les prieres ont esté dites dans sa chambre. Des le jeudy la reyne demanda a se confessor. Les medicins me prierent de l'en detourner, de peur que la preparation à la confession ne donnat quelque agitation, qui lut pû troubler le bon estat qui sembloit s'establir. Je priay la reyne de differer sa confession. Le lendemain, vendredy, elle m'en parla encore avec quelque inquietude de mourir, disoit elle, sans confession. Ce qui me determina à consentir à sa demande fut une toux très forte et un redoublement tres violent qui la prit vers les cinq heures du vendredy peu apres que les medecins furent partis avec esperance de la trouver mieux le lendemain, disant pourtant qu'ils trouvoient la fievre bien ardente. Je traitty alors avec la reyne l'affaire de la confession sur l'empressement qu'elle m'avoit marqué. Pour la delivrer de tout inquietude je la priay de prendre tranquillement tout cette preparation, qu'il falloit faire tranquillement sans manquer à prendre tous les soulagemens qui devoient l'interrompre. Ainsi fut il fait. La reyne me fit sa confession avec les sentimens ordinaires de sa grande piété, et de son vif amour pour Dieu dans une grande paix. Quelque heure apres ou trouva que la reyne s'afoiblissoit, et que la violence du mal s'augmentoit. Je pris avis de Mr. Garven, s'il jugeoit qu'il fut temps de luy faire recevoir les derniers sacremens. Il en fut d'avis, je n'eus nulle peine à en informer la reyne, qui n'en fut pas plus emue que si on luy avoit dit d'aller entendre la messe dans les temps de sa santé. Je fis avertir Monsieur le prieur, curé de la parroisse, pendant que j'estois attaché à preparer la reyne à la reception des divins sacremens. L'extreme onction luy fait premierement donnés par M. le Curé, et en suite le st. viatique. Avant que de la recevoir, elle fit demander pardon à toute l'assistante des peines qu'elle avoit pu faire a qui que ce soit, donc monsieur le curé fit le recit public. Depuis ce temps la, ou tout fut achievé à onze heures et demie du vendredy, jusqu'au lendemain sept heures et demie du samedy la reyne ne voulot plus s'entretenir qu'avec Dieu. Elle demanda les prieres des agonisans sur les deux heures apres minuit. Comme on les faisoit au pieds de son lit, elle ordonna qu'on s'aprochat pour les mieux entendre et y répondre. Les prieres ont esté faits deux fois par messieurs les aumosniers de la reyne, auquels je rependois. Mon occupation fut depuis onze heures et demie du soir vendredy jusqu'à sept heures et demie samedy de me tenir auprès de la reyne, et de me presenter de temps en temps à elle pour luy fournir des sentimens de piété. Certainement elle n'en avoit pas besoin, Car Dieu luy inspiroit luy mesme les plus dévots sentimens. ..... Elle voulut avoir le crucifix entre ses mains et sous ses yeux, et tout cela partagé entre les prieres que l'on faisoit aupres d'elle, et les sentimens qu'elle prenoit ou d'elle mesme ou de ce que je luy suggerois. Tout cela s'est passé avec toute la presence de son esprit, pendant que le corps se détruisoit par l'oppression de la poitrine ou tout le mal a abouti et par l'infiammation qui s'y est faite, mais avec quelle douce patience a elle tout souffert pendant la durée de huit heures apres les sacremens receus, ayant toujours non seulement l'esprit mais la parole libre jusques à un quart d heure avant sa mort, et mesmes dans ce quart d'heure, elle me donna des signes qu'elle entendoit tout ce qui je luy disois sans pouvoir former des paroles pour y repondre. Ainsi, ainsi cette sainte reyne s'est elle endormie au Seigneur, auquel de samedy matin 7e may, 1718. J'avois oublié qu'a quatre heures du matin elle demanda que la messe fut dite dans sa chambre à quoy elle s'unit par toute l'affection de son cœur. 2nd Article: Voicy ce qui vous regarde personnellement, dans les sentimens de la reyne, vous aves connu son cœur tendrement maternel, qui s'est toujours conservé tel jusqu'a sa mort, vous n'ignorés pas aussi les peines qu'elle a ressenties sur les derniers ordres qu'elle avoit receus de votre Majesté. Très persuadée de toute vostre affection elle m'a ordonné de vous mander que tout ce qui luy estoit venu de vostre part, quoyque contraire à ses pensées et à ses inclinations, n'avoit fait aucune impression contraire à son affection et qu'elle ne vous scavoit aucun mauvais grè, mais qu'elle vous prioit de luy pardonner toutes les peines qu'elle auroit pu vous faire par les petites contestations, sur quoy elle m'a ordonné en termes exprès de vous dire de sa part les choses les plus tendres, et de vous asseurer qu'esperant la misericorde de Dieu elle prieroit le Seigneur dans le ciel pour le succes de vos affaires presentes. j'ay cru mesmes avoir entendu qu'elle a nommé particulierement l'affaire des Suedois. D'ailleurs, en recevant le st. viatique, ayante demandé qu'on priat pour elle, elle ajouta pour le roi, mon fils, âfin qu'il perde mille vies plutost que de souffrir la moindre alteration de sa foy, ce qui fut repeté tout haut par M. le curé, lors que de la part de la reyne il dit, que sa Majesté demandoit pardon de toutes les peines qu'elle avoit pu faire à qui que ce soit. En suite elle s'est fait aporter un petit crucifix, qu'elle a mis entre les mains de madame de Molza avec ordre de vous l'envoyer de sa part, ce qu'elle luy a encore reiteré une autrefois, âfin que son ordre sur ce sujet sois fidellement executé."

Sir Hugh Paterson to the Duke of Mar.—1718, May 20, Rotterdam.—"We have now the afflicting news confirmed of the good Queen's death. By a letter I have seen from one that was present during her sickness till her death I find that the physicians that attended her are much blamed for their conduct, and, since I mention this, I must tell you that many of the King's friends both here and at home seem concerned that he has not a more skilled physician and of a better character about his person than the one they hear is at present with him. I remember very well, when the Princess died, that some of those then present complained very much, in their letters to England, of the conduct of the physicians that attended her and that he that's now with the King was particularly blamed about it. I hope he shall have very little occasion for the advice of any of them, but, should it please God to make it otherwise, it would be no small grief and uneasiness to his friends to think he should want the attendance of a prudent skilled physician, which I must take the liberty of saying Dr. Macgie is far from being thought. I have often been pressed by many to represent this, which I have omitted doing till now; therefore, if it's thought officious, I hope it will be excused, since it proceeds from no other motive than a true zeal for the King's welfare."

(*To be concluded.*)

DRUGGING BY A DENTIST.

To the Editor of THE LANCET.

SIR,—I was last night called to see a patient who gave me the following account. He had that day been to see a dentist who was treating him for a carious tooth, to which the dentist applied a dressing and gave him a bottle containing 42 pills, each of which, according to the label on the bottle, contained morph. sulph. gr. ½. He was directed to take one to three till relieved of pain. Fortunately, after taking two he felt ill and sent for me.

I am, Sir, yours faithfully,

Bradford, April 3rd, 1917. W. GILCHRIST BURNIE.

THE MANGOLD WURZEL.

THE Food Controller has just issued recipes for cooking mangold wurzels. In this connexion the following paragraph from "The Dictionary of the Farm," by the Rev. W. L. Rham, vicar of Winkfield, Berkshire (1773-1843), a book which was very popular in its time, is of interest to medical men:—

The common field-beet for cattle, which has long been known in Germany, was introduced into England at the latter end of the last century; and its introduction is generally attributed to the late Dr. Lettsom, a physician of reputation, and a member of the Society of Friends. The German name is "mangold wurzel" or "mangold" root, but it is commonly pronounced "mangel wurzel," which means

scarcity root; and by a strange translation it is called in French *racine d'abondance*, or root of plenty, as well as *racine de disette*, or root of scarcity. The name of "field-beet" is much more appropriate.

Mr. Rham also supplies much further information concerning the mangold and its cultivation. In the Dictionary of National Biography it is stated that John Coakley Lettsom translated a pamphlet on the subject from the French of Abbé de Commerell in 1787, grew the mangold himself, and imported a large quantity, which he distributed to farmers and others in this country as well as in Europe, America, and the West Indies.

The following are three recipes for cooking the mangold wurzel issued by the Food Controller:—

Recipe 1.—Ingredients: 1 lb. mangold wurzel, ¼ lb. vegetable butter or dripping, 2 small onions, pepper and salt.

Cook the mangold wurzel in the butter for about 20 minutes, or until tender. Then add the onion (which has been previously chopped) and pepper and salt. Drain for a moment before serving on cooked lentils, buttered rice, or cheese sauce.

Recipe 2.—Ingredients: 1 lb. mangold wurzel; 2 oz. vegetable butter or dripping; 2 tablespoonfuls of stock (vegetable or meat); a little pepper and salt.

Cut the mangold wurzel into small dice. Dust them in wholemeal flour. Place in saucepan together with the butter and stock, and let simmer till tender, but care must be taken that the mixture does not boil. Serve as a vegetable.

Recipe 3.—Ingredients: 1 lb. mangold wurzel.

Cut into dice and cook as for No. 1. Drain and then dip into a batter made from the following: 1 egg; ¼ lb. flour; 2 oz. breadcrumbs; sufficient milk to make a nice frying batter. Fry in vegetable butter and other cooking butter or dripping.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Thursday, April 19th.

DERMATOLOGY (Hon. Secretaries—J. E. R. McDonagh, Henry MacCormac): at 5 P.M.

Paper:

Major H. MacCormac: Skin Diseases as seen in War Conditions in France.

N.B.—No cases will be shown at this Meeting.

Friday, April 20th.

ELECTRO-THERAPEUTICS (Hon. Secretaries—E. P. Cumberbatch, R. Knox): at 8.30 P.M.

Paper:

Dr. H. J. Gauvain: Heliotherapy and X Rays in the Treatment of Surgical Tuberculosis.

ROYAL MICROSCOPICAL SOCIETY, 20, Hanover-square, W.

WEDNESDAY.—8 P.M., Dr. E. C. Hort and Mr. F. M. Duncan: The Life-history of the Meningococci and Other Bacteria.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

Museum Demonstrations (Pathology) for Medical Students and Practitioners and First-Aid and Ambulance Students:—

MONDAY—5 P.M., Mr. S. G. Shattock: Syphilis.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY.—4 P.M., Lecture I.:—Sir Robert Armstrong-Jones, M.D.: Mental States and the War. Followed by a discussion.

The following journals, magazines, &c. have been received:—British Journal of Ophthalmology, British Journal of Children's Diseases, New Zealand Medical Journal, Journal of the Missouri State Medical Association, Archives of Internal Medicine, Quarterly Journal of Experimental Physiology, Practitioner, American Medicine, Dublin Journal of Medical Science, Archives de Médecine et Pharmacie Navales, British Dental Journal, Edinburgh Medical Journal, British Journal of Dental Science.

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IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot undertake to return MSS. not used.

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MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d.* The rates of subscription remain as revised in October.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, April 11th, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Tem.	Wet Bulb.	Dry Bulb.	Remarks.
April 5	...	90	52	34	36	37	Fine
,, 6	...	86	48	33	37	38	Snowing
,, 7	0·28	76	46	33	34	35	Fine
,, 8	...	83	51	32	39	42	Fine
,, 9	0·04	75	48	39	38	39	Cloudy
,, 10	0·14	76	43	35	33	35	Cloudy
,, 11	0·19	80	44	34	35	35	Snowing

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

BOOKS, ETC., RECEIVED.

AMERICAN PEDIATRIC SOCIETY (Secretary, Dr. H. C. CARPENTER), 1805, Spruce-street, Philadelphia, Pa., U.S.A.
Transactions. Edited by L. E. La Fétra, M.D. Vol. XXVIII.

BAILLIÈRE, TINDALL, AND COX, London.
Chemistry for Beginners. By C. T. Kingzett, F.I.C., F.C.S. 2s. 6d. net.

BELL, G., AND SONS, London.
Happy Warrior and other Poems. By Augustus H. Cook, M.B. Lond. 2s. net.

CAMBRIDGE UNIVERSITY PRESS.
Finch and Baines: A Seventeenth Century Friendship. By Archibald Malloch, B.A., M.D., Temporary Captain, Canadian Army Medical Corps. 10s. 6d. net.

CONSTABLE AND CO., LTD.
Ambulance No. 10: Personal Letters from the Front. By Leslie Buswell. 3s. 6d. net.

DUNOD, H., ET PINAT, E., 47 et 49, Quai des Grands-Augustins, Paris, VIe.
Organisation Physiologique du Travail. Par Jules Amar, Directeur du Laboratoire des recherches sur le travail professionnel au Conservatoire National des Arts et Métiers. Préface de H. le Chatelier, Membre de l'Institut. 18 fr.

GEORGE WILLIAM HOOPER FOUNDATION FOR MEDICAL RESEARCH, University of California Hospital, Second and Parnassus-avenues, San Francisco, U.S.A.
Collected Reprints. Vol. I., 1915–1916.

HARRISON AND SONS, London.
Acute Appendicitis: Practical Points from 25 Years' Experience. By C. Hamilton Whiteford, M.R.C.S., L.R.C.P. 4s. net.

HEINEMANN, WILLIAM, London.
Painless Childbirth: A General Survey of all Painless Methods, with Special Stress on "Twilight Sleep" and its Extension to America. By Marguerite Tracy and Mary Boyd.

LAURIE, T. WERNER, London.
War. By Pierre Loti. Translated by Marjorie Laurie. 2s. 6d. net.
Regimental Silhouettes. By C. Gribble. With Preface by Sir H. L. Smith-Dorrien, G.C.B., G.C.M.G., D.S.O. 1s. net.

TIMES OF INDIA, Bombay.
Sanitation in India. By J. A. Turner, C.I.E., M.D., D.P.H., and Others. Second edition.

URGENCY CASES HOSPITAL, 37, Queen's-gate, S.W.
Le Faux Miroir—Reflections from the Urgency Cases Hospital. 2s. 6d.

WRIGHT, J., Bristol. SIMPKIN, MARSHALL, London.
Index of Differential Diagnosis of Main Symptoms. Edited by Herbert French, M.A., M.D. Oxon., F.R.C.P. Lond. Second edition. 42s. net.

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L.—*Laboratory Journal*, Editor of; Capt. A. H. Lowe, R.A.M.C.; Mr. J. B. Lyth, Lond.; Messrs. H. K. Lewis and Co., Lond.; Liverpool Guardians, Clerk to the; Leeds Public Dispensary, Sec. of; London Dermatological Society, Hon. Sec. of; London Hospital Medical College, Sec. of; Dr. W. Lonsdale, Lond., Messrs. Longmans' Advertising Agency, Lond.; Mr. J. Little, Melbourne; Mrs. H. G. Leyton, Lond.; Dr. O. Leyton, Lond.

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V.—Victoria Hospital, Burnley, Sec. of.

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The Lettsomian Lectures
ON
WAR SURGERY OF THE ABDOMEN.

Delivered before the Medical Society of London

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LECTURE II.[1]

Delivered on March 22nd, 1917.

THE POSSIBILITY OF SPONTANEOUS RECOVERY AFTER THE PERFORATION OF HOLLOW VISCERA.

MR. PRESIDENT AND GENTLEMEN,—It is quite true that people do recover after wounds of the hollow viscera, but the number is very few. Those who recover may be said to be the exceptions that prove the rule.

1. We have instances of late-formed fæcal fistula which may be due to sloughing of the bowel wall or to actual perforation. There have been fairly frequent instances of recovery after wounds of the colon, as has been insisted on by Makins, who, by the way, attributes such a favourable result to the intense local reaction produced by the contents of the colon.

2. Actual proof of the healing of the stomach was seen in a case in which a fragment of a mantle of a bullet perforated the liver on the anterior surface, penetrated its thickness, and wounded the stomach. The officer lived some days, and at the post-mortem one found evidence of a wound of the stomach which was closed, partly by its own reaction and partly by the application of the left lobe of the liver. The post-mortem was made by Captain J. S. Dunn. I have no doubt that if this officer had not succumbed to his other injuries the wound of the stomach would at the worst have led to a localised abscess.

3. For the history of this remarkable case I am indebted to Surgeon-General Bowlby and Captain Bell.

A soldier was shot from side to side through the body at the battle of Loos. He was not operated on and recovered. As far as I know, there was nothing special about his convalescence. He was again shot in the abdomen in the battle of the Somme and was operated upon. When the abdomen was opened several perforations of the small intestines were found in the neighbourhood of a mass of adhesions. The wounded and adherent segments were excised and the man made a good recovery. On slitting up the adherent coils an entero-enterostomy was found between two adjacent loops; in addition there were several small herniated diverticula of the mucous membrane obviously pointing to closure of the previous penetrations.

This case is of interest because the process of healing corresponds to that which Captain H. Drummond has shown to be the case when the intestines of rabbits are perforated and put back without suture. The herniated mucous membrane remains herniated and gradually becomes covered with a layer of lymph which slowly organises and seals the hole; the herniated mucous membrane still forms a diverticulum.

RUPTURE OF VISCERA WITHOUT PENETRATION OF THE ABDOMINAL CAVITY.

1. As in civil life, one meets with a fair number of abdominal injuries caused by horse kicks; by falling in of dug-outs; by burial of men by shell explosions and by blows of fragments of wood which are hurled about; they present nothing out of the common and the injuries seen are the same as in civil life. Captain J. B. Haycraft had one case which may be mentioned, in which the post-mortem examination on a man who died after burial by shell explosion showed numerous contusions of the small intestine without rupture.

2. Similar injuries are caused by large shell fragments, usually shell caps, and several cases of the latter injury have been seen in which rupture of the intestine was accompanied by extensive contusions. Some years ago Makins wrote a paper on this subject, and he came to the conclusion that such injuries are caused by the bowel being caught between the unyielding posterior abdominal wall and the on-coming object. This supposition, I think, is strengthened by the association of bruises along with perforations in the case already quoted.

3. *Rupture of solid organs by indirect violence of a passing projectile.*—Such injuries are by no means uncommon. Here is a picture of a kidney in which many cracks in the capsule were produced by shell fragments which did not themselves touch the organ. I have also seen two cases of ruptured spleen; in each case the left lower chest was hit and the ribs broken in both cases. In one the diaphragm was intact, but on opening the peritoneum much blood escaped and there was an extensive tear in the spleen. In another case the diaphragm was ruptured over a small area, the blow being a glancing one. There was a corresponding wound on the outer surface of the spleen, and from this wound there ran in all directions radiating fissures in the capsule, showing that the spleen had been burst by the indirect blow it had received.

4. *Cases in which the viscera are damaged by indriven bone fragments.*—(*a*) There are many cases of injury to the liver and spleen by the driving in of fractured ribs. There is nothing particular in these.

(*b*) The cæcum and the ascending and descending colon and also the small gut in the pelvis are all apt to be injured by small bony spicules driven in through the peritoneum. Although the projectile itself does not penetrate this membrane, it is important to remember this possibility, because when such wounds are explored it is most probable that the small holes caused by the bony fragments would be overlooked and the peritoneum assumed inviolate.

5. *Rupture of hollow organs by indirect violence.*—There seem to be two classes: (*a*) Rupture of the intestine by a bullet without penetration; and (*b*) rupture of a viscus out of the track of a perforating bullet. Cases have been reported by Owen Richards, John Fraser, J. W. Dew, and others.

(*a*) The first case was that of a man whose recti were divided almost completely by bullet. The wound was explored and the posterior rectus sheath found intact. As there were no symptoms the abdomen was not opened; the man died. At the post-mortem examination a careful search failed to show any rupture of the peritoneum. There were three holes in the small intestine which lay immediately under the wound in the abdominal wall showing the gut had not moved, although more than 24 hours had elapsed since the receipt of the injury.

Fraser's case was that of a man wounded by a piece of shell in the right iliac fossa and in which the cæcum was found bruised and a small hole in the mesenteric border of the ileum.

In Dew's case the projectile had cut all the abdominal wall through save the peritoneum, through which the cæcum could be seen. As there were no symptoms the abdomen was not opened but the man died from a ruptured ileum.

(*b*) Fraser has also published another case in which the bullet penetrated the abdomen just below the umbilicus. There were no symptoms at first, but when they arose later on, cœliotomy showed a ruptured bladder. The bladder was apparently out of the direct line of the projectile.

These ruptures may be caused apparently in three possible ways. For instance, (1) when an object such as the abdomen and its contents, made up of layers of varying toughness, is sharply hit, more friable layers underneath may come away, while the more resisting overlying layers remained intact. (2) This may be termed the "paper-bag" theory, the intestine being ruptured by a smart blow in a similar way to that in which an inflated paper bag is burst on being hit. I do not know that there is any proof that this happens, but it is rather a seductive theory. (3) There is another possibility which must not be lost sight of. A man when he is hit may fall to the ground or against some object and the ruptured intestine be due to the blow thus produced and not to the actual missile which was the indirect cause of the fall.

MECHANISM OF WOUND PRODUCTION AFTER PENETRATION.

The multiplicity of wounds of the small intestine has raised some doubt as to their method of production, especially in the case of bullets, where types of wound widely different in nature are seen. The question arises, Can a bullet pursuing a straight course cause these injuries, or must we invoke a rotation of the bullet or a bursting effect?

If a bullet is rotating quickly on a transverse axis it could easily produce complete division of the gut, but if it is radiating quickly enough to produce such injuries

[1] Lecture I. was published in THE LANCET of April 14th, 1917.

it is hard to see how it could at the same time produce small perforations. Some support is given to the rotation theory by the retention of many bullets, as one knows that their flight is unstable at the end. If the rotation theory is correct, one ought to have some evidence of this rotation at the entrance and exit holes. As a matter of fact, it is impossible to establish any relations between the size of the entrance and exit wounds in the skin and the amount of damage done to the intestine. As to the possibility of a bursting effect, it is impossible, I think, to make any definite statement on the subject. All that one can say is that when great vessels are hit by bullets nothing has ever been seen in the nature of a lesion which suggested the presence of the so-called hydrostatic phenomena.

I am rather inclined to think myself that these different types of wound are caused by the varying state of distension of the small gut. As is well known, one meets with lengths of the small intestine alternately distended with air and collapsed. If the bullet strikes a distended portion it will perforate it or cut a hole in it. If it strikes a portion which is collapsed, the intestine is so small that the diameter of the bullet is such that it could divide both coats.

DIAGNOSIS OF INTRAPERITONEAL DAMAGE.

This is determined in three ways: (*a*) By inspection; (*b*) by experience; (*c*) by symptoms. With all possible care and an extensive experience and a full appreciation of the numerous fallacies, it is frequently difficult to make sure that the wound is penetrating. If it is difficult when there is an entrance and exit wound it is still more so when there is only one wound. It may be that shock, hæmorrhage, rigidity, or rapid pulse will be present, but in some cases which are received early there will be no such guides. The wound of a hollow viscus may in itself have no symptoms if it is not extensive enough to produce shock; it is usually hæmorrhage or peritonitis which gives the danger-signal. As there is a distinct relation between the interval since the receipt of the wound and the operation it is important to be able to determine the probability of penetration.

(*a*) *By Inspection.*

Antero-posterior wounds are the easiest to judge. The only point to be remembered is the thickness of the flank muscles. Below the transpyloric plane a wound with the entrance on one side of the middle line and an exit exterior to the lateral body line of the same side is very often non-penetrating, or one that has just opened the peritoneum. Above the transpyloric line such a wound, owing to the rounded form of the thorax, is almost certain to be penetrating. The bullet which passes in and out between the semilunar lines probably does not open the abdomen, while that wound that passes in and out outside these lines probably does. In the longitudinal direction a bullet which enters near the costal margin and emerges above the groin will most likely traverse the abdomen. Where it is a question of single wounds there is really nothing except the symptoms to guide one, as it is usually impossible to tell the direction of the projectile. A great deal of help is afforded by an X ray apparatus in such cases.

One case may be quoted as showing the difficulty of judging where a missile has gone.

A man was shot beside the umbilicus. The shape of the wound suggested a bullet; the area was a dangerous one, so it was determined to explore the abdomen. As the wound was in a convenient situation the exploratory incision was made through it. It was then found that the rectus muscle was torn the length of the incision. This was enlarged downwards to the pubes, the muscle being much torn down to the bone, but the sheath and peritoneum were intact. The bullet had passed down behind the pubes and, as there were no symptoms, nothing further was done, and the case, after an interval of several days, was sent to the base doing well.

(*b*) *By Experience.*

This has shown that one has to be very careful in making a negative diagnosis, and it has also shown the wisdom of operation in doubtful cases. Bomb wounds require some notice under this heading. The fragments into which a bomb is broken on explosion are often very small, but so high is their velocity that they have very great power of penetration. The wounds are often so small and insignificant that it sometimes takes some strength of mind to explore the abdomen, although the symptoms point to the possibility of visceral involvement. The number of these wounds makes individual exploration impossible, and the only way of settling the matter is to explore the abdomen by a well-placed incision, irrespective of the situation of the wounds.

(*c*) *By Symptoms.*

These may be enumerated as follows:—Appearance, pulse, vomiting, hæmorrhage, rigidity, pain, tenderness, shock, and subjective sensations.

Appearance.—Usually a man hit in the abdomen looks ill. He is shocked and cold, often in spite of blankets and hot bottles, with which he has been surrounded in the ambulance. Sometimes he is apathetic and quiet; sometimes restless—sometimes from pain—sometimes from distress. He may be blanched or of a fair colour, even normal in appearance. Before rapid evacuation was the rule I was struck by the fallaciously good facial expression of some of these cases, and it was often that one experienced a shock on taking up such a man's hand to find it cold and clammy and the pulse running or even not palpable. Such cases invariably die, and operation only hastens their end.

Pulse.—A rapid pulse, a pulse that does not fall, or a rising pulse is an indication for operation. A slow pulse is not necessarily a contra-indication unless the wound is in a non-dangerous area such as the liver. I have seen a man with a pulse of 60, with four holes in his small intestines, four hours after receipt of the injury. A rapid pulse is caused by loss of blood, and later on by peritonitis and sepsis. It does not seem to have any very definite connexion with the number of lesions of the intestine. The pulse often falls with rest and infusion, and it often happens that a falling pulse is more an indication of the possibility of operation than a contra-indication to operative measures. A rising pulse is an indication for operation.

From Table V. one can see the general average of the

TABLE IV.

Pulse up to—	-60		-70		-80		-90		-100		-110		-120		-130		-140	
	B.	D.	B.	D.	B.	D.	B.	D.	B.	D.	B.	D.	B.	D	B.	D.	B.	D.
	1	1	3	0	8	6	14	10	49	23	12	18	21	48	5	23	7	36

B = To base. D = Died.

pulse of a man wounded in the abdomen. A pulse of 100 is very frequent and, on the whole, gives a good prognosis. A pulse of 110 seems to be a critical one, for the mortality after this rapidly mounts.

Mention may be made here of unexpected results which some pulse-rates show. A man with a pulse of 160 with a wound in the liver went to the base without operation. Another pulseless man recovered after his bladder and small intestine had been sutured. A man with a pulse of 60 died from the effects of hæmorrhage, although the bleeding was stopped by operation. A fourth man with a pulse of 90 died from gas gangrene in the abdominal wall; a fifth with a pulse of 80 died from peritonitis on the third day; and another with a pulse of 160 recovered, the reason of the rapidity being extraperitoneal hæmatoma of the bladder, which was drained. From these instances it can be seen that, although the pulse is a very good indication, there are many surprises for the surgeon.

Vomiting.—Wounds of the stomach nearly always lead to vomiting and very often to hæmatemesis, but vomiting is also met with in all kinds of abdominal injury; and beyond the fact that its absence shows that the stomach is most probably not involved, it has no special significance.

Hæmorrhage.—This will be dealt with under wounds of different organs, and it is sufficient to say here that with the exception of blanching and a rapid pulse, both of which may be produced by other causes, the classical signs, such as restlessness, blindness, or air hunger, are usually absent. When present it gives the ordinary physical signs, but, as is well known, these are not very helpful, as to produce them the amount of blood may have to be very great.

Rigidity.—A very constant but varying symptom when the cases arrive. It is seen in low thoracic injuries, wounds of the abdominal wall, and in contusions of the abdomen and with true visceral injuries.

(*a*) The rigidity produced in the abdomen by low thoracic injuries is well known, and it renders diagnosis very difficult,

especially in those cases where from a study of the track the bullet may or may not have entered the abdomen.

One such case I well remember in which a man, hit in the lower right axillary region, presented a universal rigidity of the abdominal wall accompanied by considerable pain. His condition otherwise was not bad. It was determined to watch him, and he was put to bed and kept quiet for three hours. At the end of that time the rigidity had become board-like. There was considerable increase in his pain and his pulse-rate was slightly accelerated. An abdominal exploration showed that after all the abdomen was uninvolved, and that the only possible injury was a wound of the liver on its extraperitoneal surface. Curiously enough this man died a week later from tetanus.

I do not know that there is any royal road to diagnosis between a thoracic and abdominal wound; every case must be judged on its merits. Captain B. C. Maybury has an idea that superficial abdominal tenderness is rather a feature of thoracic wounds.

(*b*) In the case of abdominal wall wounds the rigidity is apt to be local, and, as a rule, it does not give rise to very much confusion. Contusions of the abdomen do present considerable difficulty, and in cases which have recovered without operation I have seen rigidity, an extremely rapid pulse, and pallor all combined. Wounds of the pelvic floor, even when not penetrating, will produce a reflex hardness of the anterior wall, and the same may be said for some wounds of the upper thigh.

(*c*) *Visceral injury.*—Injuries both of the solid and hollow viscera are accompanied by rigidity. This rigidity seems to be brought about in three ways: (1) it is a reflex protective measure after the receipt of any wound; (2) it is also brought about by irritation of the peritoneum either by blood or infection; (3) it is largely independent of the amount of peritoneal infection, and occurs in extreme form without any naked-eye appearances of inflammation. Under such conditions it is generally accompanied by very great pain.

Rigidity often occurs when there is blood in the abdomen the source of which is only a wound of the mesentery or omentum. It is not as a rule very marked in these cases, and tends to subside with time in distinction to that due to peritonitis, which is progressive. One occasionally sees a somewhat rigid and tumid condition of the abdomen in cases arriving late. Such a condition is, according to my experience, usually only a sign of hæmorrhage which has been arrested, and I always advise the leaving alone of such cases.

Considered clinically, (1) rigidity may be slight, and this generally or local. (2) It may be confined to one part, and if this spreads it generally means an intestinal lesion. (3) Alternating rigidity. During examination the abdomen is sometimes soft and sometimes hard. This is a very puzzling condition and its indication is not very clear; it is sometimes accompanied by extensive injuries. (4) Apprehensive rigidity, if one may use the term. Here, although the abdomen looks soft and moves on respiration, it at once hardens when the hand approaches to palpate. As a rule, it is accompanied by no serious injury. (5) Board-like rigidity is most puzzling when accompanied by a slow pulse. If there is extreme pain it nearly always means that there is a wound of the intestine. (6) Complete absence of rigidity; this, when accompanied with obvious penetration of the abdomen, has often a grave significance, as has been pointed out by Taylor and Meyer. Such cases often quickly end fatally. It may be here stated that morphia in moderate doses seems to have very little effect on the state of the abdominal wall.

The spinal abdomen.—One has to be on one's guard not to be misled by the slightly rigid and tumid abdomen which is met with in cases of spinal injury, and especially when such injuries are accompanied by vomiting. This state of the abdomen is sometimes caused by a distended bladder, but it may be present without it.

Tenderness.—This phenomenon has very much the same value as the tenderness met with in penetration of the intestine due to disease. *Pain* is nearly always present in some form or another, but it varies from almost uncontrollable agony to nothing more than discomfort. There does not seem to be any particular relation between the amount of pain and the amount of injury.

Shock.

This can be considered under two heads: (1) subjective sensations; (2) shock proper.

1. *Subjective sensations.*—The sensations of a man shot in the abdomen vary in a remarkable degree. As can be well imagined the size of the projectile must have a considerable influence. The shell fuse-cap produces much the same effect as a violent blow from the heels of a horse, although there may be no open wound, and the subsequent course proves that there is no visceral injury. A somewhat similar effect may be produced when a portion of the abdominal wall is torn away, but as the blow is a more or less glancing one in such conditions the amount of "knock-out" effect is often surprisingly little. Men have walked considerable distances with such wounds, their intestines supported by a bandage. To quote a case:—

A man had his abdominal wall ripped open by a bullet just as we were being compelled to evacuate a trench. He was bandaged up with a shell dressing, and insisted on walking to a trench in the rear, where he lay on the fire-step for some time until things became quiet and he was able to be taken away to the ambulance. He made a complete recovery.

Sometimes a man, though he knows that he has been hit in the abdomen, is quite unconscious that his intestine is prolapsed, although a considerable amount may be outside his body. To quote a case:—

A man was hit just above the pubes; he experienced very little inconvenience. When the first dressing was applied some of the small gut lay on the belly wall. This was covered up with a dressing and the man taken straight to an advanced abdominal hospital. When he arrived there he was in good condition and in no pain. Six or seven feet of small intestine perforated in places lay under the dressing. He made a complete recovery after operation.

When the missile is a small one and penetrates and wounds the intestine there may be very little pain or disturbance.

One man, hit in the iliac region, in whom a subsequent operation proved intestinal injury, was quite unconscious that he had received a severe wound. He thought that he had been hit in the leg, the bullet having disturbed some of the lumbar nerves.

Another man, a bearer in the R.A.M.C., who had been wounded in the abdomen and, as subsequent operation proved, in the intestine, was brought on a stretcher to an advanced dressing station, but seeing there were many wounded to be attended to he got up off his stretcher and lent a hand.

Another case may be quoted as showing how little disturbance a wound in the intestine may produce. It was one of the cases I saw early in the war, and which confirmed my opinion that the expectant treatment was wrong. This officer had a side-to-side penetrating wound of the abdomen. When I saw him at a clearing station about six hours after receipt of the wound he was in good condition, free from pain, cheerful, and smoking a cigarette. He was unoperated; he was dead of peritonitis in 24 hours. Post mortem he had a single hole in his intestine.

On the other hand, a man shot in the abdomen by a bullet or some of the smaller projectiles may experience a tremendous blow which may knock him out. Now this sensation of a tremendous blow is experienced even when small missiles hit the limbs. It is curious to remember that the blow, or kick, sensation is experienced by those who rupture muscle fibres while playing games. It is therefore legitimate to imagine that the sensations of a violent blow have nothing to do with an injury to the solar plexus.

Pain of an intense character is sometimes experienced immediately after the receipt of the wound, and it accompanies wounds both of the upper and lower abdomen. In the latter case it was specially connected with penetrating buttock wounds. The suddenness of the pain in these cases recalls that seen in perforation of gastric ulcer or appendix. This similarity suggests that the cause of pain is connected with an irritation of the peritoneum by the bowel contents, although the escape of such matter may not be perceptible at the operation. Some people hold that the contents of the jejunum are more likely to cause pain than those of the ileum.

The following case is an example of intense sudden pain and a board-like rigidity which so often accompanies it. It should be noticed that his pulse was only 60.

L. C. was wounded in the back by rifle grenade; he was admitted within four hours of the wound. He was pale and suffering intense pain in spite of morphia. His abdomen was like a board. His distress might have been increased by the fact that, being hit in the abdomen, he was quite sure

he had got to die. He was taken to the theatre and when examined the only wound found was a small puncture on the outer side of the erector spinæ. Operation disclosed one abrasion and three perforations of the jejunum. There was no visible escape of contents. Recovery was uninterrupted. The fragment that caused the injury was no larger than a large safety-match head in bulk and so small that its weight could scarcely be appreciated by the hand.

2. *Shock proper.*—Everyone understands in a general way what is meant by shock and has in his mind a picture of a patient in such a state. When asked to define what he really means by shock he will very likely be unable to answer this question. As regards the abdomen, a state of clinical shock is produced in various ways—by a violent blow; by multiple intraperitoneal abdominal injuries; by hæmorrhage; by sepsis, which seems to be of the nature of poison shock; and by pain.

If a man is hit by a large projectile the blow will produce shock, just as any other blow will do. The man is winded or knocked out. Again, extensive injuries of the abdominal wall with exposure of the intestines will cause shock. This is also true of multiple injuries of the abdominal viscera, and there can be no doubt that the gravity of any case does rapidly mount with the number of lesions in the viscera and the number of viscera injured. Apart from these generalisations, it is very hard to make any definite statement as to the relation between the amount of shock present on the one hand and the organs injured and the amount of individual damage on the other.

Some idea of what a man's state may be after a wound in the abdomen has been given when speaking of a man's subjective sensations, and it can be seen from that that immediately after the receipt of the wound that proves fatal a man may for a considerable time be able to pursue what he was doing. I might quote here another case as illustrating this.

A flying man, well over the German lines, was hit with a high-explosive shell; it entered somewhere behind the anterior superior spine, traversed the abdomen, caused two holes in the small intestine, and then lodged in the areolar tissue behind the pubes. The man brought his machine back, made a good landing, and was brought into the casualty clearing station near by in really first-class condition. He was operated on, the wounds in the intestines sewn up, and he died within 48 hours of acute sepsis produced from the retroperitoneal tissue.

There is considerable difficulty in ascertaining the connexion between the actual damage done and the amount of shock. Regimental medical officers who see cases early can form no idea, apart from the loss of abdominal wall or protrusion of viscera, what the extent of the abdominal injury is, and by the time the cases come to operation there are the added factors of loss of blood and sepsis. The amount of shock seems to be largely due to the loss of blood, and if one could only find some easy method of supplying this fluid it is possible that our results might be very greatly improved. The transfusion of blood, although it is a comparatively simple process, is more or less cumbrous and can only be employed when conditions are quiet and when a donor is available.

A word may here be said about the effect of lesions on individual organs. It has been stated before that in the case of the liver one meets with some cases of shock which do not seem to be explained by the amount of damage or the amount of blood lost. Wounds of the spleen, apart from hæmorrhage, even though severe, do not cause much collapse. The same can be said of the kidney, and this is perhaps rather remarkable when one remembers the effect of the kidney punch in boxing. In some instances there is great shock and a pulse of 140, followed by recovery without operation.

The stripping up of the retroperitoneal tissue by blood seems to cause shock out of proportion to the amount of blood lost. The great pain of a small injury will often produce pallor and collapse and cold extremities, while the pulse is quiet.

There is tremendous scope for the investigation of this subject, and work is being done, notably by Captain Geoffrey Marshall. It is not a question of preventing shock so much as of curing it, for it is impossible to apply the ordinary anti-shock procedure to a man before he is wounded. The clinical shock produced by sepsis is often very marked and may cause death in a comparatively few hours. This, again, is well seen in cases that are dying of gas gangrene of the limbs.

CARE OF THE PATIENT BEFORE OPERATION.

In transit to hospital.—First of all, a man, wounded in the abdomen, is more comfortable if he can be put in such a position that his abdominal muscles are relaxed. He should be covered up and kept as warm as possible and saved all the jolting possible, though, from the nature of things, this cannot be done very effectively. He should be given a reasonable dose of morphia—this will relieve his pain and mental anxiety. It is well to say a word here about the administration of morphia. After the first injection has been given a reasonable time should elapse before another dose is administered. This warning is necessary because patients have arrived at the casualty clearing station very profoundly under the influence of the drug. Not infrequently, too, the patient has been dosed either by himself or by his companions without the knowledge of the medical officer.

The withholding of water.—There is no reason why water should not be given in reasonable amounts; its withholding causes great distress to the patient, who very likely is already suffering from a lack of fluid in his body.

In hospital.—When a patient arrives at an operating hospital the question of immediate operation has to be considered. On the whole, it is better to put the man to bed and watch his condition for a little than immediately to subject him to operation. It is quite true that hæmorrhage is the great danger, but, still, my experience has led me to think that on the whole a little rest does more good than harm. The interval is used to improve the man's condition.

First and foremost as a remedial measure is the warming of the patient. This is by far the best treatment of shock that I know and far transcends in its importance the ministration of stimulants of whatever nature, either by the mouth or hypodermically. The radiant electric bath covering the whole body is by far the most efficient method of applying heat, and should be used wherever an electric current is available.

Fluid can be introduced into the system by the mouth, subcutaneously or intravenously: it just depends upon the state of the patient and his capabilities of reception. I would only say that the intravenous method is by far the best and surest and is the only way of any practical use if time is an object. The fashionable method of subcutaneous saline is practically valueless in a shocked man. Pituitrine is favoured by some people.

The actual moment for performing the operation must be left to the individual judgment of the operator. If the man does not respond at all, the question must be decided whether to operate at once or whether it is worth operating at all. Sometimes even as much as six or eight hours' rest will produce such improvement that an operation is possible where at first the case seemed hopeless.

GENERAL LINES OF TREATMENT.

Cumulative experience shows the wisdom of operation in most cases, and it is now mostly a question of excluding cases on which it is best not to operate. It can be frankly admitted that this line of treatment involves operating on certain cases which would have got well without operation. It also involves operating on a certain number of cases, such as those in which there is bleeding without visceral injury, which might have got well without operation, but there is no way of telling if the hæmorrhage has stopped except by looking.

In a certain number of cases the intraperitoneal hæmorrhage, although the hæmorrhage has ceased and is not immediately fatal, not infrequently leads to intra-abdominal abscess later on. On the whole, it may be said that a policy of "Look and see" is better than one of "Wait and see." It may be useful to enumerate those cases which are best left alone.

1. Cases in very bad condition. Now there are, of course, many cases which no surgeon would feel himself justified in operating on, but there are many border-line cases which some surgeons would leave and some to whom the surgeon would feel constrained to give the chance of operation. Here the personal equation comes in, and whether he operates or not must be left to the surgeon to decide. He should, however, remember the indications of Table IV. (Pulse-rates). It need only be added here that the bolder surgeon will most probably get a worse operative mortality.

2. Cases shot high up in the abdomen and in the liver area on the whole do very well if left alone, so long as there are no symptoms of hæmorrhage; in fact, hæmorrhage is the only reason for operating on liver cases. It is, of course, true that a certain number of these succumb to sepsis at the base, but their number is not sufficiently great to warrant early interference on that account.

3. High abdomino-thoracic wounds on the left side. The type of wound more especially referred to is that which enters somewhere near the mid-line behind and emerges somewhere towards the posterior part of the axilla about the level of the sixth to eighth rib. These wounds are sometimes accompanied by symptoms suggesting stomach involvement, but on the whole they do not do badly, and operative interference does not afford very much help, as wounds high up in the cardia, or near the œsophagus, are almost impossible to close; or, if they can be reached, involve such disturbances as to be likely to lead to a fatal result.

4. Cases arriving late. I am inclined to put down 24 hours as a usual limit within which a primary operation is likely to be successful. Hæmorrhage by this time has ceased and operation is only likely to spread infection if the bowel has been perforated and to hasten the end. There are some cases in which operation may be thought advisable—namely, those with a fair pulse but with vomiting, and the operation being performed with an idea of getting over the "obstruction" by short-circuiting or an enterostomy. The operations that I have seen performed for this reason have nearly all been fatal.

The so-called Murphy operation—that of simple suprapubic drainage—is, I believe, an absolutely useless disturbance, and has, I see, been abandoned by the French, with whom it was an official proceeding in the early days.

The operation table.—The Trendelenburg position should be ready for use. Most important is the provision of some heating arrangement on which the patient can lie.

INCISION.

1. *Its site.*—This must be planned rather with a view of dealing with the probable nature of the injury than with any reference to the wounds. With an in-and-out wound we know the course of the projectile and can form a fair estimate of the organs likely to be involved. With a single wound this is practically impossible, and it is here that an X ray appatatus is so valuable, as it enables us to make the abdominal incision in the best possible place.

To give an instance of the value of an X ray apparatus, suppose there is a single entry wound near the middle of the abdomen. Without an X ray apparatus the only thing is to open the abdomen in the middle line and find out the course of the bullet, and this involves an exploration of the whole abdomen; and in the end it may be found that the only viscus injured is the colon at its peritoneal reflection. The exploratory procedure will have exposed the whole abdomen to the danger of contamination. On the other hand, an X ray picture would have located the bullet in the loin and shown at once that a horizontal exploratory wound would have met all the circumstances of the case and possibly saved a life.

A paramedian incision is the standard method of opening the abdomen and it should be used in all cases unless there is some distinct indication to the contrary. It is always better to prolong it than to make lateral right-angle extensions. The length should be 6 to 8 inches, probably the longer is the better, as free access means a very great increase in celerity.

In some antero-posterior wounds towards the lateral line of the body a rectus sheath incision has something to recommend it; the colon can be more easily reached and the field of operation limited. It is not, however, a good incision to close and it divides many nerves. Both the hepatic and splenic flexures can be reached by the rectus sheath incision, the hepatic with a good deal more ease, however.

In those cases where the missile has perforated through the body from near the mid-line to the loin, whether this direction is shown by an entrance or an exit wound, or by the aid of a skiagram, the transverse incision either horizontal or parallel to the upper or lower abdominal limits, has much to recommend it. If more room is required it can be obtained by cutting the anterior rectus sheath, but leaving the rectus muscle intact. Such an incision allows free access to the hepatic and splenic flexures, to the vertical colons, to both kidneys, and to the spleen. It also allows a systematic examination of the small intestine, if necessary. It is the only incision that allows the ascending and descending colons to be easily and properly repaired and, in addition, its posterior extremity is a convenient situation for an artificial anus at the site of the colon wound. It is not a convenient incision for the stomach, except for that portion situated near the spleen.

A similar incision starting behind and prolonged forward, if necessary, can be used with advantage in exploring lateral wounds of the body in the neighbourhood of the cæcum and sigmoid. A subcostal incision is also good in certain liver wounds.

In some cases of wounds in the back of the loin it is better to open the abdomen in the mid-line and make sure that the peritoneum has not been involved. If this is so, the wound is closed and the loin opened up and the necessary steps taken to deal with the condition found. It is always very important when there is a possibility of a colon wound, to do everything to prevent contamination of the general abdominal cavity. Such horizontal wounds suture easily and heal kindly.

2. *Its closure.*—The method of closure must depend on the condition of the patient. If the condition is critical it must be closed by through-and-through sutures. If there is time an attempt should be made to close the peritoneum separately, as many of these wounds—more than one would like—suppurate, and it is impossible to prevent this suppuration extending to the intestines if the peritoneum is unsutured. If the condition of the patient allows it the wound can be closed in layers, but in every case there should be at least three through-and-through supporting stitches.

Suppuration in the operation wounds has been a trouble. It may be partly due to defective technique, but in many cases one has to remember that the blood in the abdomen, which must well out when the cavity is opened, is full of micro-organisms; and various methods have been tried to prevent infection, but with no great success. Of late, however, there seems to have been a certain amount of improvement. It is curious that the same condition of things is found on operating on acute appendix abscess, where the peritoneum can readily combat the septic condition in which it is left, while the abdominal wound falls a victim to the bacilli.

3. *Abdominal drainage.*—Opinions differ about this, and personally I never use it myself, nor do I believe that it has any points to recommend it. When speaking of abdominal drainage I mean the ordinary drain to the pelvis or flanks. It is quite another thing to tie a small local drain to a suture line which one mistrusts, the idea of which is to form a local track in the case of a leak.

4. *Flushing the abdomen.*—Some people favour this procedure and it has a good deal to be said for it when the abdomen is full of septic blood. At the same time it is difficult to do efficiently without much exposure of the intestines. In small local infections without blood it is not to be recommended. Both saline and eusol have been used, but to heat the latter to the requisite temperature is to destroy its efficiency. The cold produced by ether is sufficient to damn it, even if its use could cleanse the abdomen. A small amount used to produce leucocytosis finds favour with some.

POST-OPERATIVE TREATMENT.

I do not know that there is anything particular to be done to the patient after operation more than is done in ordinary surgical practice after any severe operation. The question of infusion or transfusion will naturally arise and in some cases may be beneficial. Most people treat their cases in a semi-recumbent position. As to the administration of morphia, it is better to give it than withhold it if the patient is restless or in pain. Most interest turns on the condition of the bowels. Castor oil, calomel, and pituitrine all have their advocates. There can be no doubt that pituitrine is a very fine purgative, especially if injected into the muscles; sometimes it requires to be helped by a glycerine enema. Like all other purgatives, it is dependent for its action on a healthy condition of the musculature of the bowels, and if this is paralysed either by shock or sepsis it will fail to act, as do other purgatives. I am not particularly anxious about the opening of the bowels, and I am fairly convinced in my own mind that the bowels will not give trouble if the case is

going to do well; and if the case is not going to do well—and it is mostly a matter of peritoneal sepsis—no purgative is of any real avail. I think I have seen a good deal of discomfort needlessly inflicted upon people by attempts to make the bowels act.

WOUNDS OF PARTICULAR ORGANS.

The Œsophagus.

Wounds of the œsophagus are very rarely seen, while wounds of the trachea are not so uncommon. The rarity of wounds of this tube must, I think, be due to the fact that antero-posterior wounds involve the spine and transverse wounds involve the great vessels. Some of the lower thorax wounds, which are accompanied by vomiting, may be wounds of the œsophagus, but there is really no proof of this.

One curious case may be quoted where a man was hit in the back about the fourth right interspace. He was treated for a thoracic wound as there were no localising symptoms. Two days later he passed the core of a bullet and the day following the mantle.

Stomach.

Organs wounded with the stomach.—The thorax is involved in a fair number of cases. The organs wounded with the stomach in order of frequency are the small gut, liver, colon, spleen, kidney, pancreas. One case may be quoted as showing how complicated these wounds may be. In this case the stomach, small gut, transverse colon, and sigmoid flexure were all wounded together. The complicated wounds are usually side-to-side wounds of the body, or such wounds with an up-and-down inclination.

I have seen one curious case in which the anterior wall was grooved and the spleen and the kidney also wounded. This ended fatally. A curious fact is the rarity with which wounds of the spleen and the stomach are met with in association, and when so associated are nearly always fatal.

Nature of wounds.—The stomach affords many types of wound, nearly all easily explained by the nature of the projectile and the course it takes. Sometimes the stomach wall is exposed by the carrying away of the anterior abdominal wall. At other times prolapse of the stomach takes place, accompanied by that of the colon, small gut, and spleen.

Bullets passing in an antero-posterior direction make small perforations. Shrapnel balls cause larger perforations, the edges of which are more excoriated than is the case with bullet wounds, the larger size and the rounder form of the ball causing a bruising of the wall before it bursts its way through. Shell and bomb fragments make wounds commensurate to their size and shape. When the axis of the flight of the projectile becomes more or less parallel to the walls of the stomach, the wounds become larger—sometimes a linear slit; sometimes a linear slit followed by a perforation to which the name of "note of exclamation" wound may be given. When the projectile passes in through the epigastrium and out by the axilla the slits may become more or less parallel to the greater curvature. When the missile passes in about the nipple line and takes a downward and oblique direction towards the right, the wounds are more or less at right angles to the greater curvature, so that the anterior wall of the stomach, or its antral portion, may be almost completely divided.

Projectiles hitting the greater or less curvature in an antero-posterior direction sometimes cause rather extensive V-shaped injuries involving both walls. Bruises or cuts in the peritoneum or muscular coats are also met with, and in one case a piece of hard clay which had perforated the spleen was found lying embedded in the stomach wall (Captain J. Fraser).

It is important to remember that the posterior wall may be alone wounded, or it may be wounded in conjunction with the posterior wall of the transverse colon. Both of these wounds may be invisible when the abdomen is opened.

The mucous membrane does not pout when the wounds are small, but in the case of linear wounds it becomes extruded, just as it does when one incises the stomach wall in doing a gastro-jejunostomy. The anterior wall is the wall most frequently wounded.

Bleeding.—Wounds of the stomach are accompanied by very severe hæmorrhage; this is a cause of death in a considerable number of cases. The hæmorrhage, as a rule, does not come from the actual wall, but from the vessels as they run up and down the surface of the organ. The hæmorrhage may take place either into the stomach or into the peritoneum.

Possibility of spontaneous recovery.—This has already been admitted, and it only remains to be said that a great many of the injuries could not result in this favourable termination.

Symptoms.—Vomiting is a very constant feature; in fact, the stomach is the only viscus which almost always furnishes this symptom. One is often surprised that vomiting is possible with the size of the wound in the organ. There is sometimes an escape of gas from the wound, but no particular diagnostic value is to be attached to the presence or absence of liver dullness.

Treatment.—Operation is to be advised in all cases except those cases already referred to where from the track of the bullet the wound is most probably situated near the œsophageal or upper portion of the cardia. The best incision is a paramedian one. As a rule, one can tell if the posterior wall is likely to have been involved. If this is the case, or if there is any doubt, the posterior surface must be explored through the gastro-colic omentum in the usual way. The suture of such wounds may be very difficult; as are wounds of the lesser curvature involving both surfaces. There is no need to excise the wounds unless they happen to be very ragged. Gastro-enterostomy may be necessary in cases of wounds dividing the antral portion or the duodenum, or in some cases of narrowing of the stomach. This should only be done in cases of very evident necessity.

Prognosis.—The maximum period of successful suture after receipt of the wound is 36 hours, and the prognosis depends largely on the amount of hæmorrhage that has taken place and on the association of other wounded organs. As was seen in Table I. (April 14th, p. 566), the mortality mounts very quickly in complicated wounds. The amount of peritonitis present does not depend very directly on the length of time between the injury and the operation.

Secondary complications.—A secondary hæmorrhage has proved fatal in an unsutured wound on the fifth day. Major T. R. Elliot and Captain Herbert Henry have made some important remarks on "After History of Both Operated and Unoperated Gastric Wounds."[2] They showed that sutured and non-sutured wounds, and contusions are subject to ulceration, secondary hæmorrhage, and perforation. Secondary hæmorrhage occurred on the sixth, twelfth, and fifteenth day respectively; death occurred on the ninth, twenty-sixth, and the twenty-fifth day; the first from hæmorrhage and the last two from peritonitis. Major Elliot thinks that this points to the necessity of careful feeding and especially to the withholding of extractives. Subdiaphragmatic abscesses have been met with, but were not common even in the preoperative days, according to Sir George Makins.

Mortality and cause of death.—The mortality can be judged from the tables. The causes of death are shock and hæmorrhage and peritonitis at a later period. The occurrence of many deaths from hæmorrhage teaches the lesson that stomach wounds cannot be considered as innocuous.

The Small Intestine.

Frequency.—The small gut was perforated in 363 cases in 965 operations. It is wounded by itself or in conjunction with nearly all other organs, but especially with the colon and stomach and bladder.

Character of the wounds.—The character of the small-gut wounds varies in some degree with the projectile that caused them, but not to the extent that one might expect. A bullet may inflict as severe an injury as a piece of high-explosive shell. It used to be thought that a patient shot with a bullet had a better chance than one injured by a shell fragment. The present war has proved this to be a mistake. As a matter of fact, the least severe wounds are caused by the small bomb fragments. The greatest number of lesions was 20, in a man who made a good recovery after resection of 6 ft. The greatest number of lesions sewn up successfully was 14.

Bullet injuries.—The injury may be complete or incomplete—i.e., it may open the lumen or it may only excoriate, bruise, or tear the outer coats. The most common injuries are the perforations made by the bullet striking the intestine at right angles to its long axis. Here there are two perforations through which the mucous membrane pouts to form a small round rosette. Some holes are said to be so small as

[2] Brit. Med. Jour., April 8th, 1916.

hardly to admit a bullet, and in such holes the mucous membrane does not pout. Apparently, as the flight of the bullet becomes more inclined to the transverse or long axis of the gut the perforations become slits, but there are still two separate wounds. These wounds gape somewhat, and the mucous membrane overlaps the cut muscular coat, so that a considerable mucous surface meets the eye. The general appearance still suggests a rosette. The two slits may enlarge until the continuity of the intestine is only maintained by two narrow strands of the wall.

In other cases there is only one wound involving different portions of the circumference of the intestine; it may reach from near the mesenteric border to near the free margin or involve the free margin only. In other cases the free margin is slit right back to the mesenteric border, so that only a narrow strip of wall remains. It is remarkable that the last piece to be divided is usually the attached portion. Here there is a wide gaping wound with an extensive exposed mucous surface. In extreme cases the gut is completely divided. In another extreme form of injury the intestine is only represented by a long narrow strip of bowel; its appearance suggests that some animal had gnawed or worried it.

The explanation of the transverse direction of the lesions is to be found in the looped arrangement of the small intestine whereby a greater part of the tube lies in a vertical direction. As a man is usually shot either from side to side or from before backwards, the missile will usually hit the intestine at right angles. If the bullet takes an up-and-down direction one meets with longitudinal lesions of the gut.

Shell fragments.—Shell fragments cause wounds of all varieties, generally commensurate to their size.

Shrapnel balls.—These cause large ragged perforations and tears.

Bombs.—Bomb injuries often cause small multiple wounds, and the same may be said of small fragments of high-explosive shell or a disintegrated bullet.

The cause of the eversion of the mucous membrane is, on the one hand, due to the redundancy of the mucous membrane, and also, apparently, from an examination of microscopic sections, to a retraction of longitudinal coat (Captain J. W. McNee and Captain J. S. Dunn). Microscopic examination of the wounded edges also shows that the lesion is a very local one; in fact, the appearances are no more than one would expect to see if the intestines had been cut with a pair of scissors—it usually consists of a blood infiltration in the neighbourhood of the wound. Mucous membrane stains well and distinctly right up to the very tear.

As many as 20 injuries may have to be dealt with. They may be even or uneven in number, and when uneven the projectile is often found within the gut or, if even, it may still be found lying in the last hole of exit. Very often the projectile is never found, remaining lodged in the body, or it may be passed per anum. As a rule, the injuries are found fairly close together, but if multiple they may involve a long extent of the intestine (9 ft.). In a few cases small lesions are distributed over the total length of small intestine. Sometimes a knuckle of gut is prolapsed and even strangulated in the abdominal wall. Sometimes the exposed knuckle is perforated, at other times it is intact, but there are perforations within.

Symptoms.—There is nothing more to be added to that which has been said under the heading of "Diagnosis of Intraperitoneal Damage."

Treatment.—A long paramedian incision is the rule, except in those cases which have been dealt with when the site of the incision was discussed. The actual operative technique in the abdomen is as follows. If present the blood must be got rid of and the bleeding stopped. As a rule, the whole length of the small intestine must be explored, with the possible exception of those cases of side-to-side wounds involving one-half of the abdomen where a transverse incision shows that the colon has been involved alone. If there is no blood and the length of the missile's track can be seen, it may be possible to exclude small-gut injury. The cæcum or duodeno-jejunum junction is first picked up and brought out of the wound; then the intestine is inspected, taking care to look at both sides; and the examined part is replaced within the abdomen. If a small hole is found and the gut beyond it for 6 or 8 inches is intact the hole is sewn up, one suture being, as a rule, sufficient. If the next lesion that is encountered is a small one the process may be repeated. If, however, the first lesion is a large one it is better to cover it up with gauze and a clamp and to proceed with the examination of the whole length, because a big lesion, if quickly followed by another, may necessitate resection, and the amount to be resected can only be determined when the total injuries are known.

When the small intestine has been dealt with the stomach is explored if there is any likelihood of its being injured, and the colon is dealt with last of all, as it is here that an artificial anus may be very likely necessary. If a horizontal incision is used it may be better to deal with the colon first, as thereby soiling of the peritoneum is minimised.

Turning to the question of suture *versus* resection, it may be said that small and discrete injuries mean suture, while multiple or severe injuries, especially if close together, mean resection. Resection is also necessary if four inches of the mesentery is destroyed or infarcted. In some cases double resections have been necessary where there were two badly injured portions of the intestine lying far apart.

I would advise that suture be practised on every possible occasion, even if there are two or three almost complete gashes, provided they are not too close together and so long as the gut remains undivided. It is better to narrow the gut somewhat than do a resection. The general tendency amongst operators has been to abandon resection.

Circular versus *lateral suture.*—It may be said that this old controversy is still unsettled; opinion sways backwards and forwards, and I cannot see from statistics that we have got that there is any difference. If lateral anastomosis is practised the lateral openings should be made a little way from the divided ends, because it is these divided ends which last recover their motility.

Primary short-circuiting or enterostomy.—The idea of these operations is to relieve the upper segment of the bowel which is liable to dilatation from a nervous or septic cause. It has by no means found universal acceptance, and I myself should not recommend it as a primary measure—it may be useful in some of the later operations. Naturally a small-gut anus is to be avoided whenever possible, but it may be the only thing to do.

Treatment of a prolapsed knuckle.—In the early days there was some difference of opinion on what was the best treatment for this condition. Nowadays with the establishment of the operative treatment there is no doubt that the right thing to do is to open the abdomen and deal with the lesions which are found.

Prognosis.—In the first instance one may say at once that wounds of other organs increase the gravity of the prognosis. Wounds of the duodenum have been so far very fatal, but with this exception there does not seem to be any difference between the jejunum and the ileum. Possibly it is more important to take greater care with the suture-line in the case of the jejunum in consequence of the presence of bile and pancreatic fluid. Some people think that the jejunal contents are more irritating and cause greater pain than those of the ileum.

Time factor.—This has been already dealt with and it only need be again mentioned that hæmorrhage is a great bugbear and causes early deaths. It may also have a distinct bearing on the later deaths from peritonitis by spreading infection in the abdomen. As regards sepsis, to judge from the peritonitis present, it may have made considerable headway in four hours and may be practically absent after 26 hours. As regards prognosis, more stress is to be laid on paralytic distension of bowel than on the amount of lymph or fluid effused.

Mortality and causes of death.—The mortality can be seen from the general table at the end of Lecture III. Death, when it occurs in a few hours, is due to shock and the results of hæmorrhage. When it occurs later it is caused by peritonitis, which usually ends fatally between the third and fifth day.

BRISTOL ROYAL INFIRMARY.—At the annual meeting the medical report showed that 4453 military in-patients were admitted to this institution. In addition, 3733 in-patients were treated, being an increase of 252 compared with 1915. The out-patients numbered 48,944. The financial statement showed the ordinary income was £15,472 and the ordinary expenditure £23,976. Bequests amounting to £40,891 had been received, being £35,586 more than in the previous year. The debt on the institution was now £14,802.

STUDIES IN WOUND INFECTIONS:

ON THE QUESTION OF BACTERIAL SYMBIOSIS IN WOUND INFECTIONS.

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FOR many years it has been recognised that one species of micro-organism may exercise a helpful action on the proliferation of another when the two are grown together in the same culture medium. Earlier examples of this type of symbiosis—the term usually applied to this phenomenon—are: (1) the growth of an anaerobic bacillus in association with an aerobe, (2) the growth of such a bacillus as *B. influenzæ* in association with either staphylococcus or *B. xerosis*.

With regard to the first example given above in which an aerobic micro-organism enables an anaerobic one to grow freely, the explanation usually given is that the aerobe in its growth absorbs the oxygen, thus making the conditions favourable for the proliferation of the anaerobe. This principle has been frequently employed in the cultivation of anaerobes and numerous ingenious methods have been devised for thus utilising the oxygen-absorbing properties of *B. subtilis* and other bacteria.

In respect to the second example given in which the growth of *B. influenzæ* is assisted by the presence of another micro-organism such as staphylococcus no such simple explanation can be given, but it is certain that the staphylococcus furnishes a substance which enables the influenza bacillus to flourish on a medium on which it will not grow alone, and also enables it to maintain its vitality for long periods.

In connexion with septic wounds of the present war the question of symbiosis may assume very considerable importance. In all these wounds the bacterial flora is a varied one consisting as it does of anaerobic and aerobic, spore-bearing and non-sporing bacteria. As has been shown by Fleming,[1] the primary infection of the wounds is a fæcal one. At first there is a phase in which the anaerobic spore-bearing bacilli (*B. perfringens* and organisms of putrefaction) flourish together with streptococci, *B. proteus*, and diphtheroids. The anaerobic bacilli as time goes on gradually disappear, and ultimately there remain streptococci, staphylococci, diphtheroid organisms, and, at times, *B. proteus*.

The microbes (apart from *B. tetani*) which directly cause the most serious infections are, in the early stages of the wound, *B. perfringens*, possibly *B. malignant œdema* and streptococci, while in the later stages streptococci are responsible for almost all the serious complications. Although the other microbes do not usually cause serious complications, their presence in the wound becomes an important matter if it can be shown that they may act as symbiotic stimulants to the growth of the more dangerous members of the bacterial flora. The experiments detailed below indicate that this is the case.

In order to approximate the conditions of the experiment to those obtaining in wounds the culture medium usually employed was human serum, either unaltered or serum to which sufficient trypsin had been added to neutralise the antitryptic power. The *raison d'être* of this procedure was that Wright has shown that, according to their situation, the bacteria proliferating in a wound have two varieties of culture media from which they obtain their nutriment.

(i.) Those proliferating in the cavity of the wound are supplied with a fluid medium which consists of the blood fluids altered to a varying degree by the breaking down of the extravasated leucocytes—a process which leads to the liberation of a large amount of trypsin. According to the amount of trypsin thus set free the antitryptic power of these blood fluids is either diminished, completely neutralised, or the resulting fluid is even—and this is by no means an unfrequent stage—rendered strongly tryptic. All these changes render the blood fluids a much more suitable pabulum for bacteria, for it has been shown that neutralisation of the antitryptic power of the blood serum completely destroys all the antibacterial properties of the blood, and the presence of free trypsin together with albumens obviously leads to the formation of digestion products which are the best of all foods on which to cultivate bacteria.

(ii.) Those bacteria proliferating in the lymph spaces of damaged but still living tissues are bathed in a fluid consisting of lymph altered to a much slighter extent, according to the time it has been exuded from the vessels, the number of leucocytes it contains, and other, at present, unrecognised factors.

PART I.—*Do the Other Microbes Present in a Wound Aid the Growth of* B. perfringens?

Fleming[2] in some preliminary experiments has shown that staphylococci, streptococci, and *B. proteus* when grown in association with *B. perfringens* caused an increased growth of this latter micro-organism.

Before proceeding to give the details of the various experiments the following points concerning the growth of *B. perfringens* in culture should be mentioned.

B. perfringens when planted into fresh serum and incubated under anaerobic conditions will only grow when the sowing is a heavy one.

Wright has shown that if the antitryptic power of the serum is neutralised by the addition of trypsin or its alkalinity is neutralised with an acid growth occurs with a much lighter sowing.

When growth takes place in serum a very large quantity of gas is formed, so that four to five volumes of gas may be produced from one volume of serum. This circumstance affords a convenient index of the presence and also of the amount of growth.

Experiment I. Influence of staphylococci and streptococci on growth of B. perfringens *in milk.*—A broth culture of *B. perfringens* was diluted with broth 10-fold, 100-fold, and by 10-fold steps to a million-fold dilution. 40 c.mm. of each dilution was planted into (*a*) milk, 1 c.c.; (*b*) milk, 1 c.c. + 20 c.mm. staphylococcus broth culture; (*c*) milk, 1 c.c. + 20 c.mm. streptococcus broth culture. These tubes having been incubated for 24 hours were examined for growth, which was indicated by the formation of the typical clot and gas formation. The results are shown in Table I.:—

TABLE I.

No. of tube and micro-organisms planted.	Dilution of *B. perfringens* broth cultures.					
	1/10	1/100	1/1000	1/10000	1/100000	1/1000000
(*a*) *B. perfringens* only	Gr.	Gr.	0	0	0	0
(*b*) ,, ,, + staphylococcus	,,	,,	Gr.	Gr.	Gr.	Gr.
(*c*) ,, ,, + streptococcus	,,	,,	,,	,,	,,	,,

Gr. = growth.

Experiment II. Influence of diphtheroid bacilli on growth of B. perfringens *in serum (with and without the addition of trypsin).*—In this experiment pieces of 6 mm. bore glass-tubing about 15 cm. long and sealed at one end were used as culture tubes. Into these miniature test-tubes the culture materials and micro-organisms were introduced and then melted vaseline was run on to the surface to form a column about 2·5 cm. high. The index of growth was gas formation evidenced by the vaseline being pushed up the tube. Dilutions of *B. perfringens* broth culture having been made, as in Experiment I., 10 c.mm. of each was planted into 300 c.mm. of serum. Another 10 c.mm. of each dilution was planted into a similar tube of serum which had been thickly

TABLE II.

No. of tubes and micro-organisms planted.	Dilution of *B. perfringens* culture.							Culture medium.
	1	1/10	1/100	1/1000	1/10000	1/100000	1/1000000	
(*a*) *B. perfringens* alone.	Gr.	Gr.	0	0	0	0	0	TS
(*b*) ,, + diphtheroid.	,,	,,	Gr.	Gr.	Gr.	Gr.	Gr.	
(*c*) *B. perfringens* alone.	0	0	0	0	0	0	0	US
(*d*) ,, + diphtheroid.	Gr	Gr.	Gr.	Gr.	Gr.	Gr.	Gr.	

Gr. = growth. TS = trypsinised serum. US = unaltered serum.

sown with a diphtheroid bacillus. The experiment was then repeated, using serum to which sufficient trypsin had been added to neutralise the antitryptic power. The results are shown in Table II.

[1] THE LANCET, 1915, ii., 638.

[2] THE LANCET, 1915, ii., 376.

Two and a half hours after planting these cultures showed gas formation in the first tubes of series (*b*) and (*d*) and in four hours the amount of gas produced in the first tube of series (*b*) was equal in bulk to the culture fluid. Such rapid gas formation has not been noted under any other condition.

Experiment III. Do all the diphtheroids commonly present in wounds stimulate the growth of B. perfringens *to the same extent?*—Fresh human serum was divided into portions and each portion was planted thickly with a strain of a diphtheroid bacillus. The diphtheroid bacilli employed were representatives of the various groups frequently found in wounds.

Two hundred and fifty c.mm. of the serum containing the diphtheroid bacillus were distributed into miniature test-tubes, as described in Experiment II., and to each were added 50 c.mm. of dilutions, as shown below, of a *B. perfringens* broth culture (four days old). Vaseline was then poured on the top of the fluid and the tubes were incubated for five days. The results are given in Table III.:—

TABLE III.

Strain of diphtheroid used.	Dilution of *B. perfringens* culture.			
	1/1000	1/10000	1/100000	1/1000000
Forrest V.	Growth	Growth	0	0
Cation I.	,,	,,	0	0
Ford I.	,,	,,	0	0
Ryan I....	,,	,,	Growth	0
Beavan I.	,,	,,	0	0
Moore III.	,,	,,	0	0
Beavan IV.	,,	,,	Growth	0
Pretty V.	,,	,,	,,	0
Driscoll II.	,,	,,	0	0
Control*	0	0	0	0

* Without diphtheroid, *B. perfringens* only.

From the above table it will be seen that these diphtheroids all stimulate the growth of *B. perfringens* in serum and approximately to the same extent.

Experiment IV. Influence of a coliform bacillus and B. proteus *on growth of* B. perfringens *in serum.*—Similar small tubes to those used in former experiments were filled in as follows:—

Tube A. Serum 1 c.c. + *B. perfringens* emulsion 10 c.mm.
,, B. Serum 1 c.c. + *B. perfringens* emulsion 10 c.mm. + coliform bacillis emulsion 10 c.mm.
,, C. Serum 1 c.c. + *B. perfringens* emulsion 10 c.mm. + *B. proteus* emulsion 10 c.mm.

These tubes were incubated anaerobically for 18 hours and the number of *B. perfringens* estimated by counting against the number of the red blood corpuscles (Wright's method). The results obtained were as follows:—

B. perfringens per c.c.: Tube A, 62 millions; Tube B, 146 millions; Tube C, 357 millions.

Experiment V. To ascertain, when two microbes are grown in symbiosis, whether both are stimulated to increased proliferation.—The micro-organisms employed in this experiment were *B. perfringens*, staphylococcus, and streptococcus. Miniature test-tubes containing 1 c.c. of the fluid from an ovarian cyst were planted with cultures as shown below. After incubation under anaerobic conditions for two days, the number of microbes was estimated by counting them against the number of red blood corpuscles in a film (Wright's method) and also, in the case of the aerobic micro-organisms, by diluting and planting a known quantity of a dilution on to plates, which were then incubated under aerobic conditions, the resulting colonies being counted after a suitable interval. The results are given in Table IV:—

TABLE IV.

No. of tube.	Micro-organisms planted into the ovarian cyst fluid.*	No. of microbes per c.c. estimated by Wright's method after incubation.	No. of cocci obtained by plating 20 c.mm. of the fluid diluted 500 fold, after incubation.
I.	*B. perfringens* emulsion.	360 million.	—
II.	*B. perfringens* emulsion + staphylococcus emulsion.	*B. perfringens* 433 million, staphylococcus 880 million.	Innumerable colonies of staphylococcus.
III.	Staphylococcus emulsion.	400 million.	About 1500 colonies.†
IV.	*B. perfringens* emulsion + streptococcus emulsion.	*B. perfringens* 620 million, streptococcus 140 million.	265 colonies of streptococcus.
V.	Streptococcus emulsion.	50 million.	4 colonies of streptococcus.

* In each instance 10 c.mm. of emulsion was planted.
† Certainly less than half the number of colonies obtained from Tube II.

This experiment shows conclusively that when *B. perfringens* is grown in symbiosis with either staphylococcus or streptococcus the stimulation to increased growth is mutual to both species of bacteria.

Experiment VI. Influence of streptococci and staphylococci on the growth of B. perfringens *in serum.*—In this experiment the technique was modified by growing the cocci in serum for three days before planting the *B. perfringens*. Three small test-tubes, each containing 1 c.c. serum, were taken, one was planted with streptococcus, another with staphylococcus, while the third was left uninoculated. All three tubes having been incubated together anaerobically for three days an equal amount of *B. perfringens* culture was added to each. After a further incubation for 18 hours the number of *B. perfringens* were estimated by Wright's method.

Tube I. (staphylococcus + *B. perfringens*) contained 120 million *B. perfringens* per c.c.
,, II. (streptococcus + *B. perfringens*) contained 430 million *B. perfringens* per c.c.
,, III. (*B. perfringens* only) contained 62 million *B. perfringens* per c.c.

The above experiments show that the growth of *B. perfringens* is greatly increased when it is grown symbiotically with either streptococcus, staphylococcus, or various diphtheroid bacilli. It might be argued, however, that this increased growth was simply due to some simple action such as the neutralisation of the alkalinity or the antitryptic power of the serum, both of which, as mentioned above, have been shown by Wright to aid the growth of this bacillus. The following experiment shows, however, that the beneficial action of symbiosis with streptococci, diphtheroid, and a coliform bacillus is just as marked in the case when the serum, employed as culture medium, has previously been neutralised either in respect to its alkalinity or its antitryptic power.

Experiment VII.—The technique employed was similar to that used in Experiments II. and III.

TABLE V.

Series A.—In this series the culture medium consisted of serum 7 parts and distilled water 2 parts.

Micro-organisms planted.	Dilutions of *B. perfringens* culture.						
	1/1	1/10	1/100	1/1000	1/10000	1/100000	1/1000000
1. Control. *B. perfringens* only	Gr.	0	0	0	0	0	0
2. Diphtheroid bacillus + *B. perfringens*	,,	Gr.	Gr.	Gr.	Gr.	Gr.	0
3. Streptococci + *B. perfringens*	,,	,,	,,	,,	0	0	0
4. Coliform bacillus + *B. perfringens*	,,	,,	,,	,,	Gr.	Gr.	Gr.
5. *B. pyocyaneus* + *B. perfringens*	,,	,,	,,	,,	,,	0	0

Series B.—In this series the culture medium consisted of serum 7 parts and HCl N/10 2 parts (this amount of acid just neutralised the alkalinity of the serum).

1. Control. *B. perfringens* only	Gr.	0	0	0	0	0	0
2. Diphtheroid + *B. perfringens*	,,	Gr.	Gr.	Gr.	0	0	0
3. Streptococci + *B. perfringens*	,,	,,	,,	,,	Gr.	Gr.	Gr.
4. Coliform + *B. perfringens*	,,	,,	,,	,,	,,	,,	,,

Series C.—In this series the culture medium consisted of serum 7 parts, trypsin solution diluted 6 times, 2 parts.

1. Control. *B. perfringens* only	Gr.	Gr.	0	0	0	0	
2. Diphtheroid + *B. perfringens*...	,,	,,	Gr.	Gr.	Gr.	Gr.	0
3. Streptococci + *B. perfringens*...	,,	,,	,,	,,	,,	,,	Gr.
4. Coliform + *B. perfringens*	,,	,,	,,	,,	,,	,,	,,
5. *B. pyocyaneus* + *B. perfringens*	,,	,,	,,	,,	,,	,,	0

Gr. = "Growth" and refers only to growth of *B. perfringens* as evidenced by gas formation in serum.

PART II.—*Do the Various Micro-organisms Commonly Found in Wounds Favour the Growth of Anaerobic Bacilli other than* B. perfringens?

Experiment VIII. Influence of streptococci on the growth of the bacillus of malignant œdema in serum.—A broth culture of malignant œdema was diluted by ten-fold steps up to a million-fold dilution. Of each of these dilutions 40 c.mm. were planted into a series of tubes containing 1 c.c. of serum and also into a series containing 1 c.c. of serum previously planted with streptococci. Vaseline was poured into the

tubes to make a column 2·5 cm. high and the tubes were then incubated at 37° C. for five days. The results then were as shown in Table VI. :—

TABLE VI.

Series of tubes.	Dilution of broth culture of malignant œdema.						
	1	1/10	1/100	1/1000	1/10000	1/100000	1/1000000
(A) Without streptococcus.	0	0	0	0	0	0	0
(B) With ,,	Gr.	Gr.	Gr.	Gr.	Gr.	Gr.	Gr.

Gr. = growth.

Experiment IX. Influence of diphtheroid bacilli, streptococci, and staphylococci on the growth in serum of the bacillus of malignant œdema and B. Hibler IX.—A quantity of serum was divided into two portions, one of which was implanted with the bacillus of malignant œdema, the other with *B. Hibler IX.* These implanted sera were now distributed in two series of minute test-tubes, 0·2 c.c. being added to each. One tube of each series was kept as a control, the others being further implanted with a different micro-organism. Melted vaseline was now poured on to the surface of the fluid and the tubes were incubated at 37° C. After varying intervals the tubes were examined for growth of the anaerobic bacillus which was demonstrated by the formation of gas. The results are shown in Table VII. :—

TABLE VII.

Other micro-organism planted.	Serum planted with the bacillus of malignant œdema.			Serum planted with *B. Hibler IX.*		
	Time of incubation in days—					
	3	5	9	3	5	9
None	0	0	0	0	Gr.	Gr.
Diphtheroid No. I. ...	Gr.	Gr.	Gr.	Gr.	,,	,,
,, No. II. ...	,,	,,	,,	,,	,,	,,
Streptococcus fæcalis ...	,,	,,	,,	,,	,,	,,
Staphylococcus	,,	,,	,,	0	,,	,,

From these two experiments it is seen that the ordinary non-sporing microbes found in wounds greatly stimulate the growth of the malignant œdema bacillus and *B. Hibler IX.*, both of which have been said to cause gas gangrene.

PART III.—*Do the Other Microbes Commonly Present in a Wound Favour the Growth of Streptococcus?*

As streptococcus is the cause of many of the complications, such as cellulitis or septicæmia, which occur even in the earlier stages of wounds and, in the later stages, is the one markedly pathogenic microbe, with the exception of staphylococcus, that is almost constantly present, any condition which favours its growth must be at once recognised as of great importance. In the earlier stages the associated microbes are usually *B. perfringens*, putrefactive anaerobic bacteria, *B. proteus*, and diphtheroid bacilli, while in the late stages it is associated with diphtheroid bacilli, *B. proteus*, and staphylococci.

Throughout these experiments in determining the amount of streptococcal growth the total number of cocci were counted by Wright's method or the number of living cocci were estimated by diluting the culture and plating out a known quantity of a dilution on an agar plate.

Experiment X. Influence of B. perfringens *on the growth of streptococcus.*

Tube I. 1 c.c. fresh human serum planted with 10 c.mm. streptococcus emulsion.

,, II. 1 c.c. fresh human serum planted with 10 c.mm. streptococcus emulsion + 40 c.mm. *B. perfringens* broth culture.

After incubation for 18 hours under anaerobic conditions the number of streptococci was counted by Wright's method.

Tube I. (streptococcus only) contained 100 million streptococci per c.c.
,, II. (,, + *B. perfringens*) ,, 360 ,, ,, ,,

Experiment XI. Influence of B. perfringens *on growth of staphylococci and streptococci.*—Four tubes, each containing 1 c.c. of serum, were taken. Two of them were planted with *B. perfringens*, the other two remaining unplanted. After all the tubes had been incubated together for 24 hours under anaerobic conditions an equal quantity of staphylococci culture was planted into one of the unplanted tubes and into one of the *B. perfringens* cultures. The remaining tubes were similarly planted with streptococcus. After having been incubated under anaerobic conditions for 24 hours each culture was diluted 1000-fold with broth, and 10 c.mm. of this dilution was distributed on to the surface of an agar plate. These plates were incubated under aerobic conditions, and the resulting colonies of streptococcus or staphylococcus were counted. The results are shown in Table VIII.:—

TABLE VIII.

Tube I. (*B. perfringens* + staphylococcus) gave about 600 colonies of staphylococcus.
,, II. (Staphylococcus only) gave 64 colonies of staphylococcus.
,, III. (*B. perfringens* + streptococci) gave about 1000 colonies of streptococci.
,, IV. (Streptococci only) gave 1 colony of streptococci.

When it is considered that both streptococci and staphylococci grow much more readily in unaltered serum than *B. perfringens* this enormous stimulation of growth is all the more surprising.

Experiment XII. Effect of diphtheroid bacillus on growth of streptococci.—Into each of three small test-tubes 1 c.c. of serum was placed. To the first was added 10 c.mm. of 1000-fold diluted broth culture of a streptococcus; to the second 10 c.mm. of 1000-fold diluted broth culture of a diphtheroid bacillus; and to the third 10 c.mm. of the 1000-fold diluted streptococcus culture and 10 c.mm. of the 1000-fold diluted diphtheroid bacillus culture. The number of living micro-organisms in each tube was then estimated by plating out a known quantity on agar and counting the resulting colonies. The three tubes were then incubated for 10 hours at 37° C., after which the number of living micro-organisms was again estimated by the same method. The results are given in Table IX. :—

TABLE IX.

No. of tube and implantation.*	Content of living streptococci per c.c.		Content of living diphtheroid bacilli per c.c.	
	At time of planting.	After 10 hours incubation.	At time of planting.	After 10 hours incubation.
1. Streptococcus culture ...	13,000	2,800,000	—	—
2. Diphtheroid culture	—	—	2000	5,300,000
3. Streptococcus culture and diphtheroid culture ...	13,000	120,000,000	2000	2,600,000

* In each instance 10 c.mm. of broth culture diluted 1000-fold.

This experiment shows a very great increase in the numbers of streptococci in Tube 3 where streptococci are grown in association with diphtheroid bacilli. In this tube there was after 10 hours more than 40 times as many streptococci as in an exactly comparable tube where the streptococcus was grown by itself.

Association with streptococci did not appear to favour the growth of the diphtheroid bacilli; on the other hand, it seemed to retard it, as there were only half the number of living diphtheroid bacilli in the tube containing the mixed culture as there were in the tube in which the diphtheroid bacillus only had been grown.

With regard to the mechanism by which the aerobic organisms help the anaerobes the following experiment is of interest.

Experiment XIII.—An ordinary broth culture tube was incubated with a diphtheroid bacillus such as is commonly found in wounds. The cotton-wool plug was cut off short and pushed a little way down the tube. Melted vaseline was now poured on the plug so as to soak into it and to leave a layer of vaseline about 0·5 cm. thick on the top. The tube was put in the incubator, and when it had reached incubator temperature a mark was made at the upper level of the vaseline. As oxygen was absorbed from the tube so the vaseline was sucked down, and at intervals marks were made corresponding with the level of the vaseline.

The height of the column of air in the tube was 87 mm.

In 6 days the vaseline was sucked down 7·5 mm. = 0·09 of total volume
In 10 ,, ,, ,, 13·5 mm. = 0·15 ,, ,,
In 4 months ,, ,, ,, 17·5 mm. = 0·2 ,, ,,

We see, then, that ultimately the amount of gas absorbed was 0·2 of the total volume, which corresponds with the amount of oxygen in air, and the absence of oxygen was confirmed by the introduction of pyrogallic acid and caustic soda, when no further absorption took place and no brown colour was produced.

Further experiments showed that staphylococcus, streptococcus, *B. pyocyaneus*, and some coliform bacteria absorb oxygen to a greater or less extent during their growth.

While this oxygen absorptive power may play some part in the symbiotic action of aerobic bacteria on the anaerobes, yet it cannot be the only explanation, as the experiments cited above show that the stimulant action of the "aerobic" bacteria is exercised when the cultures are grown under absolutely anaerobic conditions.

Summary and Conclusions.

Part I.—The experiments described show that:—

(i.) The proliferation of *B. perfringens* is much more rapid when it is grown in symbiosis with streptococcus, staphylococcus, various diphtheroid bacilli, *B. proteus*, *B. pyocyaneus*, and a coliform bacillus.

(ii.) Such increased growth occurs equally well when the culture medium consists of fresh serum or of serum which has been neutralised either in respect of its alkalinity or its antitryptic power, indicating that the increased proliferation in fresh serum cultures is not due to either of these changes taking place.

(iii.) All strains of diphtheroid bacilli, commonly isolated from wounds, were found to be practically equally efficient in stimulating the growth of *B. perfringens*.

(iv.) Not only were a much larger number of *B. perfringens* found in the cultures grown in symbiosis with these various bacilli after a certain period of incubation, but it was also found that an almost infinitely smaller number of *B. perfringens* would proliferate under these conditions than when pure cultures were made.

(v.) When *B. perfringens* and streptococci are grown in symbiosis a much more abundant growth of *both* microbes results.

Part II.—The experiments detailed show that:—

(vi.) Nos. (i.), (ii.), and (iv.) of the above conclusions applied equally when the bacillus of malignant œdema or *B. Hibler IX.* was substituted for *B. perfringens*.

Part III.—The experiments described show that:—

(vii.) *B. perfringens* when grown in symbiosis not only with streptococci, but also with staphylococci, leads to an enormous increase in the number of cocci found in the culture.

(viii.) Streptococci grown in symbiosis with diphtheroid bacilli gave a much more abundant growth than when grown in pure culture. The growth of the diphtheroid bacilli in the mixed culture was, however, 50 per cent. less than in the pure culture.

(ix.) The final experiment shows that diphtheroids and many other bacilli have the power of absorbing oxygen to a greater or less extent during their growth, but that this property will not account entirely for the increased proliferation that occurs, when aerobes and anaerobes are grown in symbiosis, since similar mixed cultures placed under anaerobic conditions show quite as marked an increase of growth.

These experiments indicate that bacterial symbiosis may play a very important rôle in wound infections. For as regards gas gangrene, which is caused by the invasion of the tissues by certain anaerobic bacilli, the commonest being the *B. perfringens*, it is well known that very large doses of pure cultures of this bacillus have to be inoculated into animals in order to produce this disease with certainty; again, Wright has shown that to obtain a growth of this bacillus in serum a very heavy implantation is necessary, but if the serum is altered by neutralisation of its alkalinity or its antitryptic power a very much smaller sowing will produce an abundant culture. From these experiments he concluded that the conditions leading to such an alteration of the blood fluids play an important part in the production of gas gangrene.

Taking these facts into consideration, together with many of the clinical aspects of gas gangrene, it would seem apt to compare the action of *B. perfringens* in the production of this disease with a high explosive which is comparatively harmless until the explosive action is started by a detonator. Keeping this simile in view, it is obviously of the utmost importance to ascertain those conditions which act as "detonators" in the growth of this bacillus, and the experiments detailed above show that over and above those factors which have been described by Wright there is another—namely, symbiosis—and that this is in *in vitro* experiments the most important as yet described, since the growth of *B. perfringens* obtained in serum under such conditions is not only much more rapid in development and more copious in quantity, but also follows the lightest implantations.

These results would, for example, explain the occurrence of gas-gangrene in those cases where the number of bacilli introduced into the wound at the time of its infliction was comparatively small. They would also explain the frequent occurrence of gas-gangrene in those cases in which after a thorough cleansing and opening up of the wound—a procedure which should reduce the infection to a minimum—free drainage is prevented either by suture or unsuitable dressings. Again, these experiments would explain the almost "explosive" onset of gangrene in some of the severe, heavily infected wounds, for the results obtained in Experiment II., in which, within four hours, gas equivalent to the volume of the serum used as a culture medium was produced, indicate a rate of growth which has never been approached under any other conditions.

These experiments show also that the streptococci multiply much more rapidly when grown in symbiosis with various bacteria, amongst these being the group of diphtheroid bacilli which are present in practically every infected wound from the earliest stage until cicatrisation is complete. Such being the case, it is very probable that symbiosis plays an important part in the production of cellulitis and similar complications due to streptococci occurring in the earlier stages of the wound, and also accounts for the common occurrence of the severe inflammatory reactions which so frequently follow operative interference in the later stages of the wound.

CLINICAL TYPES OF SUBTERTIAN MALARIA

AS SEEN IN SALONIKA IN SEPTEMBER, OCTOBER, AND NOVEMBER, 1916.

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DURING last September, October, and November we had an opportunity of seeing over 3600 cases of malaria. The diagnosis of malaria has been founded either on a positive blood finding or on the history of the case, temperature chart, and a definitely hard palpable spleen. In a small proportion of the cases other infections were present in addition. In isolated cases a double infection with subtertian and quartan parasites was found. Owing to the fact that in some 40 per cent. of the cases we were unable to demonstrate the parasites in the peripheral blood stream we are not in a position to give exact figures of the relative amounts of benign and subtertian infections, but there can be no doubt that during this period the percentage of subtertian infections was very high. The relatively high proportion of the negative blood finding is due to the fact that practically all the patients were under the influence of quinine on admission to the hospital and many of them had been several days under hospital treatment before admission to a base hospital. Further, owing to pressure on beds, it was generally impossible, in the less severe cases, to make more than one blood examination.

The majority of the cases were of the simple subtertian, double subtertian, and irregular types of subtertian pyrexia without local manifestations. These cases uniformly responded well to treatment with quinine. The most important group of cases with local symptoms, on account both of relative frequency and of difficulty of differential diagnosis, were characterised by more or less urgent gastro-intestinal symptoms. This group could be separated into several more or less definite types.

Dysenteric.—A large number of the cases were sent into hospital with a diagnosis of dysentery. A prominent symptom was the presence of diarrhœa. The great majority of the patients stated they were passing "blood and slime," but this is a mere formula with most of them and of no value in diagnosis. In most of these cases the stools were fluid and fæculent, without definite blood or mucus, and they varied

in number from 6 to 15 or more in 24 hours. These cases rapidly improved under quinine. In a smaller number of cases the stools contained definite blood and mucus. It was possible in the great majority of these cases to demonstrate a superadded infection with one of the organisms of the dysenteric group. In a few other cases patients admitted with malaria but without dysenteric symptoms developed genuine bacterial dysentery; and again, cases with bacterial dysentery, after a few days in hospital, showed genuine malaria with protozoa in the blood. In a few cases where the diarrhœa tended to persist concurrent infections with *Lamblia intestinalis*, *Tetramitus*, *Trichomonas*, and *Balantidium coli* were demonstrated. Apart altogether from these cases there were a considerable number of patients admitted whose dominant symptom was diarrhœa, and in whom repeated examinations of the stools failed to demonstrate any dysenteric organisms or amœbæ. Several of these cases died, and the autopsy showed, in some, slight congestion of the colon, chiefly in its upper part; in others, definite small submucous hæmorrhages; and in one, to be described in detail, extensive submucous hæmorrhages, but a perfectly intact mucous membrane. In many of these cases the bowels moved at first from 20 to 30 times a day. The stools were liquid, fæculent, and not unlike Worcester sauce. In the majority this diarrhœa very speedily subsided under energetic quinine treatment. In some the stools were fæcal, liquid, more or less heavily tinged with blood, and, very characteristic, notably bile-stained. This stool, although containing blood and traces of mucus, is yet macroscopically quite distinct from the typical dysenteric stool. As examples of those types we may quote the following cases:—

Corporal F., aged 32, admitted on Sept. 20th, 1916, with profuse diarrhœa and pyrexia. The bowels were moving about every hour; stools fluid, fæculent, and heavily tinged with bile and blood. Spleen enlarged and hard; blood film showed very heavy infection with subtertian parasites of all types, rings, rosettes, and crescents. He was treated with intravenous quinine and salines. The stools were examined for organisms of dysenteric group and protozoa with a negative result. The diarrhœa continued, the stools constantly containing blood and traces of mucus. Ultimately he became incontinent and died eight days after admission. Post mortem, spleen was enlarged to four times normal size. Large intestine showed moderate congestion with small punctate submucous hæmorrhages; no ulceration, and whole mucous membrane smooth and glistening.

Sergeant B., aged 24, sent into hospital on Sept. 2nd, 1916, with history of having been unwell for nine days, at first with constipation, abdominal pain, and vomiting. Three days before admission he began to suffer from severe diarrhœa. On admission he was collapsed and bowels moving every half hour; stools liquid, fæculent, and heavily stained with blood and bile. Marked icteric tinging of sclerotics. The blood showed the presence of numerous subtertian rings. The diarrhœa continued and ultimately the motions appeared to consist of almost pure blood. Post mortem, the whole of large bowel showed a microscopically intact smooth glistening mucous membrane without any suggestion of ulceration. Extensive submucous hæmorrhages were present throughout whole of large bowel.

Choleraic pernicious fever.—Fortunately only two cases of this type were met with. Both cases died within 15 hours of admission in spite of intravenous quinine and salines.

Private K., admitted on Sept. 14th, 1916, from a camp alongside our lines. On admission was in state of profound collapse, with subnormal temperature, sunken cheeks, blue nails, and cold, cyanotic extremities. Mentally he was dull, and it was difficult to get a history, but it appeared he had not been well for two days, although he remained on duty till day of admission. Parasites not found in blood film. There was incontinence of fæces, and a watery brown fluid without visible blood or mucus continued to ooze from anus. He died within 12 hours of admission. Post mortem, spleen was slightly enlarged and almost diffluent. Colon and sigmoid flexure presented moderate congestion but no trace of ulceration. Smears from spleen, after prolonged search, showed rings and crescents of subtertian malaria.

The other case was exactly similar except that it was a second attack and that the parasite was readily found in the blood.

Appendicular type.—Cases strongly suggesting appendicitis have not been infrequent. In all we have seen some 12 cases of this type. The chief complaint was vomiting and severe pain referred to the right iliac fossa, associated with moderate pyrexia and marked tenderness and rigidity in the right iliac fossa. In most of the cases it was possible to show that the rigidity was not constant. In some of the cases the tenderness was most marked somewhat above McBurney's point; in others it corresponded accurately with this point. In all of our cases we were able to demonstrate either the presence of the parasite in the blood or a definite enlargement of the spleen. None of our cases showed a leucocytosis, and all had the typical relative lymphocytosis of malaria. All rapidly cleared up under quinine treatment. We have also seen a few cases in which the abdominal pain and rigidity were so marked and so diffuse as to suggest an acute abdomen, but these also rapidly cleared up under the use of quinine with the exception of one case which was complicated with septicæmia. This at the autopsy showed a purulent pleuritis and peritonitis, in the exudates of which streptococci were demonstrated.

Bilious remittent fever.—Thirteen of our fatal cases were of this type. These cases had all been ill several days before admission to the base hospital. On admission they were collapsed, with marked yellowing of the conjunctivæ and a peculiar earthy facies. They suffered much from almost constant vomiting, and the majority from bilious diarrhœa and mental confusion. After treatment by intravenous quinine and intravenous saline they improved from a condition of apparently extreme urgency to one of relative comfort, but, unfortunately, the improvement was not maintained, and after a period of from two to five days their condition again became critical. The jaundice became deeper, the vomiting, often accompanied by uncontrollable hiccough, again became severe, the bowels incontinent, the temperature rose, and they died in coma or delirium. The chief macroscopic features post mortem were enlargement of the spleen and submucous hæmorrhages in various organs, and the presence of a gall-bladder distended with thick dark bile.

Pernicious fever with pulmonary symptoms.—Both numerically and as a cause of death the next most important group was that in which the patients' dominant symptoms were referred to the respiratory tract. Of the cases of malaria which terminated fatally, pulmonary complications of a pneumonic or broncho-pneumonic character were present in 7, and were the immediate cause of the fatal issue. Amongst the patients admitted to the hospital were a large number who complained of respiratory symptoms, and some who were admitted under the varying diagnoses of bronchitis, broncho-pneumonia, and congestion of the lungs, were found subsequently to be suffering from subtertian malaria. In them the malarial parasite could be demonstrated in the blood. Amongst these cases were a small proportion who, in addition to their malaria, gave a history and presented the physical signs of a chronic bronchitis and emphysema, and in them the occurrence of a malarial attack caused a decided increase in their symptoms and physical signs. In the majority of cases, however, there was no history of bronchitis nor any evidence of emphysema. Amongst these the pulmonary complications could be divided into the bronchitic, the broncho-pneumonic, and pneumonic.

The bronchitic type.—The patients complained of pain and tightness in the chest with persistent cough, accompanied by expectoration. They presented the ordinary signs of a diffuse bronchitis with numerous rhonchi and râles scattered all over both lungs. Some showed the typical malarial pyrexia, others an irregular intermittent pyrexia, while others ran a normal or subnormal temperature throughout their stay in hospital. They differed from an ordinary bronchitis, only in the presence in the blood of the malarial parasite, and their rapid response to treatment by quinine. It is not suggested that the bronchitis is caused by the malarial parasite, and it may be that the bronchitis is nothing more than that which is usually associated with the onset of any acute febrile illness. Nevertheless the respiratory symptoms are so well marked and the patient's complaint is so entirely referred to his chest that one is, we think, justified in separating out a definite clinical group—the bronchitic.

The pneumonic and broncho-pneumonic type.—The term pneumonic is not strictly accurate for the whole of this group of cases, and all that it is meant to convey is that we are dealing here with a group of cases in which the physical signs suggest that there are in the lungs areas of more or less extensive consolidation, some definitely lobar, others lobular or confluent lobular. To this group belong the fatal cases

already referred to. In all of these seven cases subtertian parasites were demonstrated in the blood, and in all were definite physical signs, in some lobar, in others lobular consolidation. Of these seven cases at autopsy four showed definite lobar consolidation of one or more lobes, complicated in two cases by hæmorrhagic pleurisy. These showed the ordinary macroscopic appearance of lobar pneumonia in the grey hepatic stage. In the other three cases there was extensive lobular consolidation of both lungs. In one case there was present, in addition to the broncho-pneumonia, 12 ounces of blood-stained serous fluid in the pleural cavity. In both these groups we would appear to be dealing with a superadded infection, in which the malarial parasite was at the most but a predisposing cause. It is worthy of note, however, that during this period only one case of pneumonia unassociated with malaria was admitted.

A third group comprised a series of cases which from the onset of the illness presented definite pulmonary physical signs and symptoms which pointed to areas of definite consolidation in the lungs, though the course of the disease was not that of a true lobar or lobular pneumonia. Two cases are described in detail. In both subtertian parasites were demonstrated in the blood.

Private F., aged 20, reported sick on Oct. 22nd, 1916, complaining of shivering, malaise, and diarrhœa. Admitted to hospital on the 29th. He was pale, with slight icteric tint of sclerotics. The spleen was three fingers' breadth below costal margin. Over left lower lobe posteriorly there was evidence of consolidation with bronchial breathing and numerous medium-sized moist râles. Anteriorly there was bronchial breathing in second, third, and fourth left intercostal spaces. No definite dullness on percussion either anteriorly or posteriorly and vocal resonance and fremitus not markedly increased. The lung condition remained practically unchanged until Nov. 13th, when the breath sounds lost their bronchial quality, became a little weak, and a friction rub developed over the left lower lobe posteriorly. On day of admission temperature rose to 103° F., pulse to 112, and respirations to 32. Next day temperature did not rise above 99°, but on following day again rose to 103°. It fell again on the subsequent day and then remained normal. The pulse-respiration ratio was not at any time much disturbed. There was little cough and no expectoration. He was treated with 20 grains of quinine intramuscularly twice a day for the first six days, and then by 20 grains intramuscularly and 40 grains by mouth for the next seven days.

Lance-Corporal I., aged 29, reported sick on Nov. 1st, 1916, complaining of pain in chest, headache, and shortness of breath, no shivering. On the 4th he was admitted to hospital with diagnosis of congestion of lungs. He did not have the general appearance of pneumonia nor did he look very ill. Dyspnœa was evident only on exertion. Spleen just palpable. Whole of right lung was involved. Anteriorly breath sounds above and below clavicle were bronchial and all over anterior aspect of lung were numerous moist sticky râles. Movement was diminished, but no appreciable percussion dullness. Posteriorly there was slight percussion dullness over right supraspinous fossa and over right base. Breath sounds over supraspinous fossa were bronchial and in a small area just below spine of scapula distinctly tubular. Numerous râles were present all over right lung and a few râles at left base. On admission temperature 99·8° F., pulse 96, respirations 36. On following day temperature was again 99·8°, falling on third day to normal. On the fourth day his general condition became worse. The temperature rose to 102·8° and for two days he lay in a curious state of wandering delirium. His temperature fell on the following day and did not rise above 99° at any other period of his illness. During the sudden rise in temperature the pulse was 84 and respirations 30, showing a distinct disturbance of pulse-respiration ratio. The signs over right side of chest gradually diminished, but on the 12th, without any rise of temperature or any increase in symptoms, a large area of consolidation was found over the left lower lobe posteriorly, accompanied by numerous moist râles. On the 27th the right lung was completely clear, but the left lower lobe still showed bronchial breathing and râles. At no time was there any expectoration. Treatment was carried out with quinine by mouth.

These cases have been detailed because, although the chest signs and symptoms were perfectly well defined, suggesting a lobular consolidation, the course of the disease was certainly not that of lobular pneumonia. One of the cases showed a disturbance of the pulse-respiration ratio, the other did not. Neither case had any expectoration. In neither case was the temperature chart that of a pneumonia, but was certainly characteristic of a malarial attack. In both cases subtertian parasites were found in the blood. The character of the pulse remained good throughout the course of the disease, and at no time were the patients seriously ill. It is difficult to suggest what the exact pathological condition in those cases is, but we consider there is no doubt that there is a clinical type of malaria associated with the physical signs of more or less extensive consolidation of the lungs, in which there is no evidence whatever of a superadded infection. This type may be conveniently designated the pneumonic.

Cerebral cases.—An extremely interesting, but relatively small, group of cases presented cerebral symptoms of the well-recognised cerebral types, but, as we intend to describe these later in detail from the point of view of treatment, we will only briefly mention them here. In all we have had nine cases in which the dominant symptoms have been due to local affections of the nervous system. Two of these were of the bulbar type and showed temporary paralysis of the muscles supplied by the bulbar nuclei; both recovered and were discharged from the hospital without any evidence of organic disease. One patient was admitted with a diagnosis of debility. Twenty-four hours after admission he suddenly became comatose and remained so for 15 hours. He also completely recovered. One patient 21 hours after admission, while in the latrine, developed an epileptiform fit. These fits, which were of a general epileptiform character, were repeated about 12 times in the following 24 hours. The left leg became somewhat weaker than the right and developed an extensor plantar reflex, which at the time of writing is still present. In addition the patient still presents definite nystagmus and a tendency to a reeling gait, but no evidence of active disease. In four cases the most marked symptom was violent delirium, which persisted for several days uninfluenced by variations in the temperature. In three of the cases there was a high, intermittent pyrexia, in one the temperature was never above 99° F. In all the cases subtertian parasites were demonstrated in the blood and all the cases completely recovered. One patient presented meningitic symptoms associated with pneumonia at the right base This patient died. The autopsy showed a considerable excess of cerebro-spinal fluid beneath the tentorium with œdema of the pia-arachnoid over the base, and congestion of the vessels over the pons. Section of the brain after hardening in formalin showed no evidence of gross brain disease The middle and lower lobes of the right lung presented the features of an ordinary croupous pneumonia.

Generalised œdema with ascites.—Two cases were admitted complaining of breathlessness and having generalised œdema.

Driver W., aged 35, reported sick on Oct. 6th, 1916, complaining of breathlessness, swelling of feet, legs, and face, and headache. Admitted to hospital on the 9th. On admission there was considerable œdema of hands, feet, and legs, and eyelids were puffy. Visible mucous membrane almost colourless; some lemon-coloured tinting of sclerotics. Abdomen notably distended, subcutaneous tissues œdematous, and all the characteristic signs of a considerable accumulation of free fluid in peritoneal cavity. The spleen extended almost to umbilicus; liver not enlarged. Slight mitral systolic murmur, rate of pulse 78, and rhythm of heart normal. Apex beat in fourth space in nipple line. Nothing abnormal was made out in the lungs. The urine was of a specific gravity 1012, clear, straw-coloured; no albumin, bile, or sugar; deposit showed a few uric acid crystals, but no casts. Temperature normal on day of admission (Oct. 9th), but rose to 103° F. on evening of 10th, to fall on morning of 11th to 99·8°. From the 15th onwards temperature remained normal. Blood film showed presence of subtertian rings and crescents. Treatment by intravenous quinine was commenced on the 10th and later continued intramuscularly and by mouth. On the 12th condition was immensely improved; œdema of feet and hands had almost disappeared, and it was no longer possible to demonstrate free fluid in abdominal cavity. On the 16th the blood was free from parasites, and he was discharged to hospital ship on the 23rd.

Private B., aged 25, reported sick on Oct. 27th, 1916, complaining of swelling of legs and breathlessness; previous to present illness had always been healthy. He was admitted to hospital on the 27th. On admission patient presented notable œdema of legs and of subcutaneous tissues of back and abdomen, and eyes were puffy. Visible mucous membrane pale; slight lemon tint of sclerotics. Abdomen considerably distended and gave all the characteristic signs of

free fluid in abdominal cavity. Spleen extended almost to umbilicus; lower margin of liver half an inch below costal margin. Apex beat of heart in fifth space almost in nipple line; pulse-rate 96, rhythm normal; second pulmonic sound not definitely accentuated. Nothing abnormal made out in lungs. The urine did not contain albumin or casts. Blood film showed presence of subtertian crescents and rings and red blood cells marked anisocytosis and polychromatophilia. Temperature normal and remained so. Patient treated at first with intramuscular quinine and later with quinine by mouth. By Nov. 11th œdema of extremities and physical signs of ascites had completely disappeared. He was discharged to a hospital ship on Nov. 15th.

In these two cases we have the presence of œdema of the face and extremities and notable ascites without any evidence of either primary heart or renal disease. Both cases showed the presence of subtertian parasites, and both very rapidly cleared up under quinine treatment. Apart from the absence of any evidence of heart disease the distribution of the œdema, affecting the face, and the presence of a notable amount of ascites without enlargement of the liver are sufficient to exclude a cardiac origin for the œdema. Similarly the presence of a perfectly normal urine in both cases excludes a renal origin. We would suggest that the œdema is of toxic vascular origin similar to the œdema and ascites seen in the late stages of multilobular cirrhosis of the liver.

Gangrene of the feet.—Another group, consisting of three cases, showed evidence of local vascular changes in the development of gangrene of the toes.

Private B., A.S.C., aged 26, admitted to hospital on Oct. 4th. Reported sick on Oct. 1st, complaining of loss of use of legs and numbness of feet. He stated that he had not been unduly exposed before reporting sick. On admission to hospital temperature was 102° F., conjunctivæ slightly icteric, and spleen palpable. Blood film showed presence of numerous subtertian parasites. He complained of very severe pain in both feet, shooting up the legs; both feet were considerably œdematous, and over dorsum of each foot was a large purple ecchymosis. The great toe and all smaller toes of right foot and the small toes of left foot were slightly swollen and almost black in colour. On soles of both feet, from bases of toes backwards for a distance of about one inch, the skin was purple in colour. Sensation to gross touch was still present; the dorsalis pedis and posterior tibial arteries of both feet could be felt pulsating quite strongly. As it was considered possible that a vascular spasm aggravated by quinine might be a factor in the condition, the patient was not given quinine, but was treated with 0·4 gm. galyl intravenously. Next morning the temperature had fallen to normal, and remained so for the remainder of the patient's stay in hospital. The general condition steadily improved; blood reported negative to malaria on the 10th. The feet rapidly improved, and apart from slight superficial necrosis on dorsum of right foot completely recovered. On Oct. 14th he was put on 20 grains quin. sulph. daily by mouth and was discharged to hospital ship on the 28th.

Private M., aged 24, admitted to hospital on Oct. 11th. Reported sick on Oct. 5th, complaining of shivering, pains in head and back. For three weeks before reporting sick his company had been resting behind the line. On Oct. 7th when taking off his boots he noticed that his feet were cold and that his toes were blue. He found that he was unable to stand on his feet on account of pain and because "he could not feel his feet." On admission to hospital his only complaint was pain in his feet. Presented distinct icteric tinging of sclerotics; spleen palpable. Both feet showed discolouration of the toes, the left foot being more affected than the right. All the toes of both feet were affected, the colour varying from brownish-purple to purple. On the left foot the plantar surface of all the toes showed small bullæ; on the right foot only the large and third toes presented bullæ. The dorsalis pedis and the posterior tibial arteries of both feet could be readily felt pulsating. Patient was put on 1 drachm quin. sulph. daily and steadily improved. Both feet recovered without any loss of tissue.

Driver W., aged 21, admitted to hospital on Oct. 9th with diagnosis of malaria. Reported sick about ten days before admission to base hospital on account of shivering and pain in head and back. On second day of admission to a field ambulance the feet became very cold and continued so in spite of hot bottles. Next day the feet were seen to be blue. On admission to base hospital there was considerable œdema of both feet, all the toes of both feet were blue with large bullæ, especially on right big and second toes, extending for some distance over dorsum of feet. Several bullæ were burst and were discharging sero-purulent fluid. The dorsalis pedis and posterior tibial arteries could be felt beating quite strongly in both feet. Marked icteric tinging of sclerotics; spleen palpable one inch below left costal margin. Blood film showed no malarial parasites. Patient on admission was given an intravenous injection of 0·4 gm. galyl, and ten days later was put upon quinine. General condition rapidly improved, but considerable sloughing occurred over dorsum of large and second toes of right foot, involving loss of nail of great toe, and opening into first interphalangeal joint of second toe. Also slight superficial sloughing over dorsum of left large toe.

Mortality and Post-mortem Findings.

Thirty cases infected with malaria have died. Of these one was a case of subtertian malaria who was quite convalescent from malaria when he developed an extremely septic throat followed by pneumonia. Post mortem there was ulceration of the pharynx and epiglottis with septic consolidation of both lower lobes of the lungs. In two cases there was in addition to malaria a Shiga dysentery and the patients died of running dysentery. Post mortem, in both cases almost the entire mucous membrane of the whole of the lower bowel and the lowest two feet of the ileum was destroyed. One case died of amœbic dysentery and septicæmia. The mucous membrane of the lower bowel was much destroyed and there were abscesses in both kidneys. Four cases died of lobar pneumonia affecting one or more lobes. In one of those there was, in addition, an extensive hæmorrhagic pleural exudate. In those cases malaria was not the cause of death.

This leaves 22 cases with a total case mortality of 0·61 per cent. Three cases presented at the autopsy extensive lobular consolidation of the lungs, complicated in one by hæmorrhagic pleurisy. The immediate cause of death in those cases was also probably the lung condition, and it is a debatable question whether they respresent a double infection or a true complication of malaria. Two cases died of septicæmia. One was admitted to hospital with a septic arm following an intramuscular injection of quinine. At the autopsy pyæmic abscesses were found in the lungs and kidney and recent vegetation on the mitral valve. One was admitted in an extremely collapsed condition with numerous septic sores on both arms and developed signs of pleural and peritoneal effusion. At the autopsy there was found a right-sided septic pleural effusion and septic peritonitis. Streptococci were recovered from the pleural and peritoneal fluids.

Excluding those 5 cases, we have 17 cases of uncomplicated malaria with a mortality of 0·47 per cent. In one case the autopsy disclosed moderately advanced granular kidneys and in one case a right-sided hydronephrosis which had largely destroyed the right kidney.

We take this opportunity of thanking Colonel Purves Stewart, C.B., A.M.S., consulting physician to the Salonika Force, for his valuable assistance and advice, which was always at our disposal during this period. To Lieutenant-Colonel P. Mitchell we are also indebted for permission to use the hospital records, and to Captain R. Richards, R.A.M.C. T.F., for the hæmatological and bacteriological and post-mortem reports.

SHORTAGE OF MIDWIVES IN CORNWALL.—At the last meeting of the Cornwall Sanitary Committee the county medical officer of health (Dr. E. M. Clarke) reported that 20 additional midwives were required for the parishes of Cornwall. He stated that at present there was an excessive birth mortality in the county, 4·5 per 1000 births, compared with 4·0 per 1000 in England and Wales, and 2·0 per 1000 in some London districts, adding that the mortality rate depended upon the quality and amount of attendance available at birth. The committee decided to recommend the Cornwall County Council to make an additional grant of £275 for the training of nurse-midwives.

THE LATE MR. ALFRED UPTON.—The death occurred at his residence at Hove, on April 10th, of Mr. Alfred Upton, L.R.C.P. Lond., M.R.C.S., who had practised in Brighton and district since the year 1877. He came of an old North Sussex family, being a son of the late Mr. Henry Upton, of Petworth. Educated privately, he studied at St. Bartholomew's Hospital, London, where he was Foster prizeman and obtained distinction in surgery and forensic medicine. In 1875 he took the L.S.A. diploma and became M.R.C.S. in the following year. At Hove he had an extensive practice, and he will be greatly missed among the poorer classes, by whom he was regarded as a friend. Mr. Upton was a prominent Freemason, and was interested in sailing, cycling, and gardening. He leaves a widow and daughter.

NOTES ON THE SYMPTOMATOLOGY OF PARATYPHOID FEVER.

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THE following notes on the symptomatology of paratyphoid fever are based on the study of the case-sheets of patients admitted to an isolation hospital in France during the last five months of 1915 and observed by the writer and his colleagues. The diagnosis was confirmed, or rather established, by laboratory tests in all cases, the routine examination including one or more cultivations from the blood, three or more cultivations from the urine and fæces, and three agglutination tests. The large majority of the cases were infected by the *Bacillus paratyphosus B*; the incidence of typhoid and paratyphoid A being so small that these infections have not been included in the tables given below, which refer solely to 237 available records of paratyphoid B.

The main features to which attention will be directed are: (1) The type and symptoms of onset; (2) the type of pyrexia; (3) the condition of the spleen; (4) the eruption; (5) the appearance of the patient and the general course of the disease. These points do not, of course, by any means cover the whole ground, but may be found of some interest to those who desire to study the clinical details of the enteric group of infectious fevers.

1. *Type of onset.*—Three types have been noted:—

(*a*) The abrupt onset, which is by far the most frequent in this series, and includes two-thirds of the cases. The history of this type of case begins with an abrupt rise of temperature, accompanied by headache, shivering, and general malaise. Diarrhœa, usually lasting a few days, is common, and less so abdominal pain and vomiting. The initial diarrhœa occurs more frequently in cases in which the febrile attack is prolonged, and the same is true of vomiting. Thus in 56 cases in which the fever lasted for more than 14 days, initial diarrhœa occurred in 52 per cent. In 34 cases in which the fever lasted for 7 to 14 days it occurred in 30 per cent., while in 18 cases of under one week's fever the percentage was only 22.

(*b*) The second type of onset is still sudden, but is preceded by a variable prodromal period in which the patient is not well, but is generally able to perform his usual duties. This type was noted in 16 per cent. of the cases. The prodromal period varied in length, in one case it was given as 12 hours, and in others as two or three weeks, but usually it lasted for two or three days. The most usual symptom during this time was diarrhœa, which was noted in 36 per cent. of the cases; headache occurred in 20 per cent., anorexia in 12 per cent., backache and abdominal pain in 8 per cent. The abrupt exacerbation or true onset did not differ from that described above.

(*c*) The third type only occurred in 16 per cent. and was gradual and prolonged. It differed from the other two groups, as will be seen from the following figures:—

	Per cent.		Per cent.
Gradually increasing headache	83	Mild diarrhœa	42
Abdominal pain	50	General aching	33
		Vomiting	21

The point at which the patient gave up work was variable, and did not depend entirely on the severity of the symptoms, so that an actual day of onset was difficult to fix.

Some relationship appears to exist between these three types of onset and the duration of the fever, or, in other words, the severity of the intoxication. In the following table it will be seen that the abrupt onset, though most frequent in all cases, occurs in a higher proportion among the shorter attacks while the highest percentage of insidious onsets is found among cases of a more prolonged and severe character.

Duration of fever.	No of cases.	Percentage with—		
		Sudden onset.	Prodromal symptoms.	Gradual onset.
Over 14 days	90	62·2	20·0	17·8
7 to 14 days	45	75·5	11·1	13 3
Under 7 days	22	81·7	9·1	9·1

Symptoms of onset.—The following table shows the frequency of the various *initial* symptoms and is based on the records of 157 cases. It is interesting to note that this table corresponds very closely with the figures published by Torrens and Whittington,[1] and Wiltshire.[2]

	Per cent.		Per cent.
Headache	84	Cough	13
Shivering	49	Vertigo	11
Diarrhœa	41	Constipation	7
Abdominal pain	32	Sore-throat	3
Backache	28	Epistaxis	2
Vomiting	25	Herpes labialis	1
General aching	24	Fainting	1

If the three tables are combined the following results are obtained:—

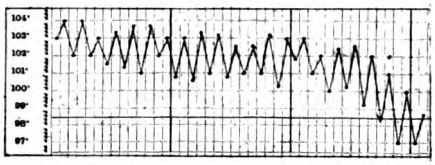
Headache	90%	out of 385 cases		General aching	25%	out of 385 cases	
Diarrhœa	45%	,,	385 ,,	Vomiting	17%	,,	335 ,,
Shivering	37%	,,	307 ,,	Cough	13%	,,	307 ,,
Abdominal pain	32%	,,	385 ,,	Epistaxis	10%	,,	307 ,,
Backache	26%	,,	307 ,,	Vertigo	9%	,,	307 ,,
				Sore-throat	4%	,,	385 ,,

2. *Type of pyrexia.*—The longer fevers naturally show a more characteristic type; thus in 97 cases in which the pyrexia was maintained for 10 days or more the following five types were distinguishable:—

(1) *Simple continued type.*—These constitute about 29 per cent. of the total and show no distinctive features except the common tendency to remission towards the end of the

CHART A (Type 1).

The chart gives in each case the morning and evening temperature, and the thicker lines indicate intervals of a week.



attack. (Chart A.) In the chart shown the course of the fever is remarkably regular, and shows the abrupt initial rise. In other cases in this group the temperature was more fluctuating and irregular.

CHART B (Type 2).



(2) *Intermittent type.*—This group includes 43 per cent. of the series, and is to a certain extent characteristic of paratyphoid infections. The temperature in these cases, while remaining

CHART C (Type 2).

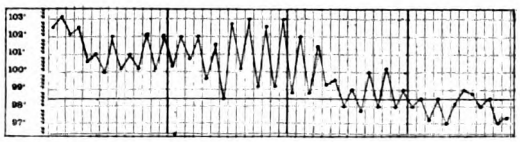
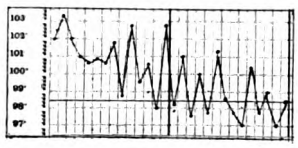


CHART D (Type 2).



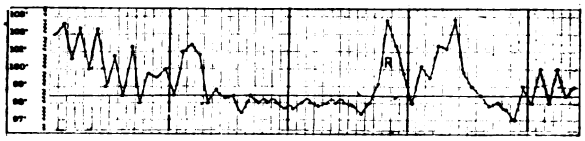
high in the evening, drops towards or below normal in the morning ("spiky chart"). The intermissions may be observed either at the beginning or end of the attack (Chart B), but are probably most frequent when the temperature is beginning to fall (Charts C and D).

(3) *Undulant type.*—This small group constitutes 12 per cent. of the cases. No correlation was traced between this type of temperature and other features in the attack either as regards severity, the appearance of the rose spots, or the agglutination reaction of the serum. The mean duration of the fever was

[1] Brit. Med Jour., Nov. 13th, 1915.
[2] Practitioner, 1915.

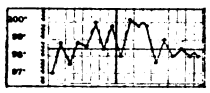
22 days, the longest period being 34 days and the shortest 14. In one case (Chart H) a relapse occurred showing the same

CHART H (Type 3).



R, relapse.

CHART H (*continuation.*)



type of temperature as did the original attack.

In two cases the rise of temperature constituting the ascending wave was definitely due to pleurisy and bronchitis, and in five others there were physical signs of bronchitis in the lungs, but no correspondence could be traced between the undulations in the temperature and the extent of the bronchial affection. In two cases not included in this group the temperature rose again after an apyrexial period of one or two days, which seems to connect the undulant type with attacks, followed by a definite relapse.

(4) *Low irregular fever.*—In 5 per cent. of the series the fever was a low, irregular type, the morning temperature being normal or subnormal and the evening temperature usually 99° or 100° F. This type may begin with a few days' high fever. The mean duration of the pyrexia in this group

CHART L (Type 4).

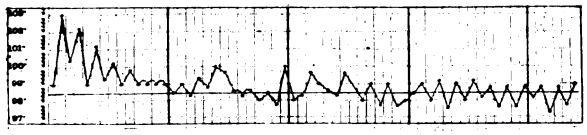
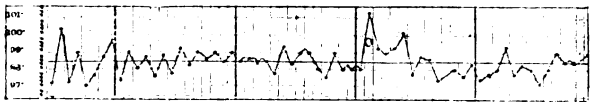


CHART L (*continuation*).

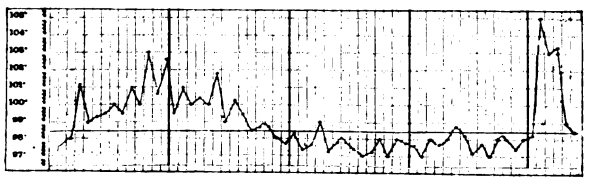


O, otitis media.

was 33 days, the longest period being 63 days and the shortest 15 days. The illness, though somewhat prolonged, is, as might be expected, of a mild nature. It is not associated with any special clinical or bacteriological characteristics (Chart L).

(5) *Type with subsequent rises of temperature.*—In this group, about 11 per cent. of the total cases, the initial fever, may present the characteristics of any of the preceding types; the outstanding feature of the group being a sudden rise of temperature lasting from 24 to 48 hours, which occurs some days after the primary pyrexia is over and the general symptoms have subsided. These sudden rises may be repeated at intervals; they are usually accompanied by some headache and the general aching pains common in febrile states, but all the symptoms clear up as soon as the temperature becomes normal. In one case severe sweating and shivering were noted; in one case the spleen was enlarged,

CHART M (Type 5).



and in two there was tenderness over the left hypochondrium. In none of these cases was tenderness over the gall-bladder noted, though this occurs and has been held to point to a cholecystitis. In one case a blood culture made when the temperature was rising showed a negative result. In true relapse a positive culture can often be obtained from the blood when the temperature rises abruptly on the first or second day (Charts M and N).

CHART N (Type 5).

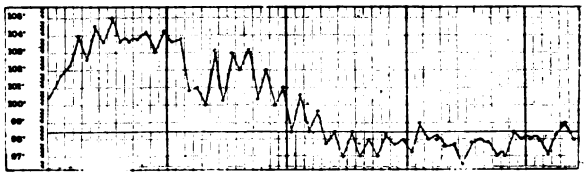
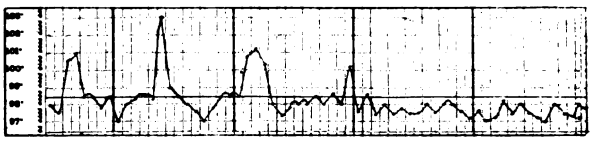


CHART N (*continuation*).



The following table shows the days on which the temperature rose in 11 cases, reckoned from the first day of normal temperature.

7th day	1 case.	5th and 12th day ...	1 case.
8th ,, ...	3 cases.	9th and 15th day ...	1 case.
16th ,, ...	1 case.	15th and 20th day ...	1 case.
17th ,, ...	1 case.	25th and 31st day ...	1 case.
4th and 9th day ...	1 case.		

In another series of 31 cases in which the fever lasted for 10 days or less the same phenomenon was observed in 4 cases. Two of subsequent rises of temperature occurred on the sixth day after the subsidence of the initial fever, one on the thirteenth day and one on the twenty-first day. In a fifth case, in which the initial fever was very short, the subsequent rises occurred on the fifth and fourteenth days. In this case the agglutinations were positive to paratyphoid B on two occasions in dilutions of 1:750 and 1:500 respectively, but no cultures were obtained. (Chart O.)

CHART O.



3. *Condition of the spleen.*—In the total series of cases the spleen could be palpated in 43 per cent.; increase of splenic dullness and tenderness in the splenic region were observed in others in which the organ itself was not felt.

In a few cases the spleen was palpable as early as the fourth day of disease, and in most it remained so till the end of the febrile period. Occasionally it did not return to its normal size for two or three days after the temperature had fallen. In these cases no relapse occurred. The organ is firm to the touch and the edge is usually easy to delimit; in six necropsies the actual weight varied from 3½ to 9 ounces, the average being 6½ ounces.

4. *The eruption.*—The characteristic eruption was observed in 63 per cent. of the total series.

The earliest appearance of the rash (one case) was on the third day and in some others it appeared for the first time on the fourth. In some cases crops of spots continued to come out till the beginning of the fifth week, and the last appearance of spots was in not a few cases subsequent to the final fall of temperature. The most marked feature of the rash was its pleomorphism, the following types occurring either singly or in association on the same patient:—

(i.) Small, well-defined spots, not much raised and of a darkish pink colour.

(ii.) Large, well-raised, light pink spots, with ill-defined, irregular margins.

(iii.) Fairly well-defined spots surrounded by a faint pink or purplish areola.

(iv.) Moderately sized, well-defined spots, conical in shape, with a tendency to become vesicular.

5. In the milder cases the appearance of the patient is not distinctive, but in cases of more severe type there is a peculiar bloated, flushed appearance which is to some extent characteristic. The patient is also somnolent or drowsy, but as a rule can answer questions accurately when roused. Although intensely toxic cases occur, in the great majority the patient does not appear so poisoned as the height and duration of the fever would lead one to expect. Convalescence is soon established, and if no sequelæ occur complete re-establishment of health is rapidly attained. A brief period of tachycardia is not, however, uncommon during convalescence. In three-fifths of the cases summarised the fever lasted for more than 14 days.

AN IMPROVED METHOD FOR THE ESTIMATION OF SUGAR IN THE URINE AND BLOOD.

BY P. J. CAMMIDGE, M.D. LOND.

IN the *Journal of Biological Chemistry* for November, 1915,[1] F. M. Scales described a new volumetric method for estimating reducing sugars, which he states gives as accurate results as those obtained by weighing, but with an expenditure of less than a quarter of the time.

A known volume of the saccharine solution is added to an excess of Fehling's solution and the mixture boiled for two minutes. It is then agitated to bring the precipitated cuprous oxide into suspension, immediately poured through a special funnel into dilute hydrochloric acid contained in a specially prepared volumetric flask, and made up to the mark with boiling water. After thorough mixing an aliquot part of the resulting cuprous chloride solution is pipetted into a known volume of dilute standard iodine solution and the iodine not reduced by the cuprous chloride titrated with a standard solution of thiosulphate, using dilute starch as the indicator. The difference between the number of cubic centimetres of thiosulphate solution oxidised by a blank control containing the same volume of iodine solution and the number of cubic centimetres of thiosulphate acted on by the iodine remaining after the addition of the cuprous chloride being proportional to the amount of cuprous oxide in the original solution, and this in its turn depending upon the strength of the saccharine solution, the percentage of sugar in the latter can be calculated by the use of appropriate tables and factors.

Shortly after the appearance of Scales's paper I carried out a number of experiments with solutions of various reducing sugars of different strengths, and was able to confirm his claims as to the accuracy and speed of the process. I therefore decided to adapt it to the estimation of sugar in the urine, as it did not involve the use of chemicals that are now difficult to obtain or are prohibitive in price, beside being simple and comparatively rapid. Experience suggested modifications in the technique to overcome minor difficulties which were encountered, and resulted in the evolution of a process that is, I think, an improvement on Scales's method. An account of the procedure I now employ may be useful to others, especially as, with slight modifications, it can be used for the estimation of sugar in the blood, cerebro-spinal fluid, &c., thus avoiding a multiplicity of apparatus and reagents, and giving results that are more strictly comparable.

In place of the Fehling solution employed by Scales I use a modified Benedict solution, made by dissolving 200 gm. of sodium citrate, 100 gm. of anhydrous (or 200 gm. of crystallised) sodium carbonate, and 10 gm. of sodium bicarbonate in about 600 c.c. of distilled water by the aid of heat, and adding to it, with constant stirring, a solution consisting of 21 gm. of crystallised copper sulphate dissolved in about 150 c.c. of distilled water. When the mixture has cooled to the room temperature it is made up to 1000 c.c. with distilled water and filtered. Preserved in a tightly stoppered bottle, this solution keeps indefinitely and may be used for qualitative as well as for quantitative work. It is about ten times as sensitive to the reducing action of sugar as Fehling's solution, so that a very small proportion of urine gives an unmistakable reaction even when it contains a very low percentage of sugar, and as it is not appreciably reduced by uric acid, creatinine, &c., the main difficulties encountered in using Fehling's solution are obviated.

Owing to the presence of sodium carbonate the addition of hydrochloric acid in the quantitative method causes an evolution of carbon dioxide, so that the subsequent operations are carried out in an atmosphere of that gas, thus preventing oxidation of the cuprous salts by the air—an improvement on Scales's process, where reliance is placed on the high temperature, speed of manipulation, &c. I find that the best results are obtained if 25 per cent. of a saturated solution of sodium carbonate (20 per cent.) is added to the copper reagent immediately before use. One of the drawbacks to Scales's original method is the way the reduced cuprous oxide tends to adhere to the walls of the beaker, especially after it has been used for several estimations, and if it is not of Jena glass. By adding the hydrochloric acid to the boiling copper solution this difficulty is overcome, and, as the atmosphere of steam in the beaker is replaced by inert carbon dioxide, the risk of oxidation is diminished. The cuprous chloride solution that results, still in its atmosphere of carbon dioxide, may be poured directly into the iodine solution through a suitable funnel without coming in contact with the air, at the same time avoiding the discomfort of measuring and pipetting the boiling hot liquid. The omission of the latter processes is also an economy of time.

Twentieth normal iodine solution is the most convenient to use. As the accuracy of the results depends largely on this solution, it must be very carefully prepared by dissolving 9 gm. of potassium iodide in about 200 c.c. of distilled water, then adding exactly 6·35 gm. of pure re-sublimed iodine and shaking occasionally until it is dissolved; finally, the solution is made up to 1000 c.c. with distilled water. A corresponding twentieth normal solution of sodium thiosulphate is made by dissolving about 13 gm. of the crystallised salt in about 500 c.c. of distilled water and making up to 1000 c.c. This solution is standardised against the iodine solution, preferably after standing over-night, using a 1 per cent. starch solution as the indicator and diluting as necessary according to the formula, $\frac{N \times d}{n} = C$, where N = the quantity of thiosulphate solution left to be diluted (in cubic centimetres), d = the difference between the actual and theoretical number of cubic centimetres of thiosulphate required in the trial, n = the number of cubic centimetres actually used, and C = the amount of distilled water (in centimetres) to be added to bring the solution to the standard strength.

The only special apparatus required in carrying out an estimation is a 200 c.c. conical flask fitted with a rubber stopper perforated with two holes, through one of which is passed the stem of a large-headed thistle-funnel, while the other is left open to act as a vent. The stem of the funnel is drawn out to a jet and is so arranged that the tip of the jet is just covered when the flask contains 100 c.c. of water.

Detection of Sugar in the Urine.

The modified Benedict solution is first used to determine the presence of a pathological excess of sugar in the urine and also to gain an approximate idea of the amount.

For this purpose about 5 c.c. of the solution are placed in a clean test-tube and eight drops, not more, of the urine added. The contents of the tube are then boiled, either in a free flame for one to two minutes, or, what I find much better, in a boiling water-bath for five minutes. In the latter case the water must be actively boiling when the test-tube is placed in the bath and it must be kept in a state of active ebullition for the whole of the five minutes. The advantages of this method are, first, the tendency of the boiling fluid to bump and spurt is avoided; second, there is no appreciable loss by evaporation, which may cause a misleading turbidity; third, a number of tests may be carried out simultaneously in a numbered rack, thus saving time.

When the heating is completed the test-tube is allowed to cool undisturbed at the room temperature for two minutes; if the urine is "sugar-free" the copper solution is clear, or only shows a faint blue turbidity due to precipitated urates, at the end of that time; should sugar be present, it becomes more or less opaque and changes colour, either before or after cooling, the bulk, colour, and rapidity of formation of the precipitate varying with the percentage of sugar. If there is only a small amount, under 0·1 per cent., or the reducing substance is chiefly pseudo-lævulose,[2] a light green opacity forms after the test-tube has been removed from the water bath; a more bulky green precipitate, present when the tube is taken out of the boiling water, indicates about 0·1 to 0·5 per cent., a dense yellow precipitate suggests about 0·5 to 2·0 per cent., and a thick red precipitate points to there being over 2·0 per cent. of sugar.

Estimation of Sugar in the Urine.

When a rough idea of the probable percentage of sugar has been gained a specimen of the urine is diluted with water according to the following scheme:—

A, light green precipitate, dilute	40 c.c.	to	100 c.c.
B, a dense yellow	,,	,,	20 ,,
C, a thick red	,,	,,	10 ,,
D, occasionally*	,,		5 ,,

(* This dilution is only required if the urine contains over 6 per cent. of sugar, which is shown by a trial estimation with the previous dilution failing to give a satisfactory result.)

Exactly 5 c.c. of the diluted urine are now added to 15 c.c. of modified Benedict solution and 5 c.c. of a saturated solution of sodium carbonate, contained in a 200 c.c. beaker. The beaker is covered with a watch-glass, placed on a wire gauze over the flame of a Bunsen burner, and its contents heated to boiling. After exactly three minutes' boiling the watch-glass is removed and 10 c.c. of hydrochloric acid (sp. gr. 1·16) are cautiously run in, taking care to avoid excessive frothing. The contents of the beaker are now

[1] Jour. of Biol. Chem., 1915, xxiii., 81.

[2] Cammidge: THE LANCET, 1915, i., 320; 1916, i., 1216.

poured as rapidly as possible into the thistle-funnel of the flask described above, which has been previously prepared by placing in it about 100 c.c. of water and exactly 20 c.c. of twentieth normal iodine solution, measured with a pipette kept for the purpose. Care must be taken that the copper solution does not run into the flask too quickly and that it is thoroughly mixed with the iodine solution, as it does so by gently rotating the flask. The beaker is washed out with a few cubic centimetres of hot water and the washings poured into the funnel.

The flask is now unstoppered, the stem of the funnel washed into the iodine with a little water, and the standardised twentieth normal thiosulphate solution run into the latter from a burette until the brown colour of the iodine is almost discharged. At this point five or six drops of fresh, cold starch solution (about 1 per cent.) are introduced and the addition of the thiosulphate continued until the blue colour of the resulting iodo-starch is completely discharged. When the end-point is reached the solution has a faint light-green colour which it is quite easy to distinguish from the blue of the iodo-starch, even by artificial light. A control consisting of 100 c.c. of water and 20 c.c. of twentieth normal iodine, measured with the same pipette, is titrated with the sodium thiosulphate solution in a similar way. The difference between the number of cubic centimetres of thiosulphate used in the test and consumed by the control, multiplied by a factor varying with the dilution of the urine employed according to the following table, gives the percentage of sugar in the original urine:—

If a 40%	dilution	(A)	was used, multiply by	0·0845
,, 20%	,,	(B)	,, ,,	(2 × 0·0845) = 0·169
,, 10%	,,	(C)	,, ,,	(4 × 0·0845) = 0·338
,, 5%	,,	(D)	,, ,,	(8 × 0·0845) = 0·676

The total excretion for the day can then be worked out if the amount of urine passed is known. This is essential if reliable inferences are to be drawn, for although it seems obvious that a consideration of the percentage of sugar or any other substance alone is likely to be misleading, especially in a condition where the daily output of urine may vary considerably from the normal average, it is a fact that is frequently overlooked, as patients are often sent to me for consultation bringing an odd sample of urine, either not taken from a 24-hour collection, or, if it is, without any attempt having been made to estimate the quantity passed.

With the apparatus and solutions at hand an accurate determination of the percentage of sugar in a urine may be made by this method in ten minutes or less, and when a series of estimations is being carried out the time for each can be still further reduced. A control for every specimen is not necessary, but as the sodium thiosulphate solution gradually deteriorates on keeping, especially if it is not prepared with fresh distilled water and is not kept from contact with the air, it should be titrated against the standard iodine at frequent intervals. When it is used only occasionally it would probably be best to keep a stock solution of approximately double strength and dilute down as required, according to the results obtained with a trial titration against the standard iodine solution.

Estimation of Sugar in the Blood.

The same reagents and apparatus are employed as for the determination of sugar in the urine, but the iodine and thiosulphate solutions are diluted with distilled water, in a measuring flask, 1 in 50 (i.e., to thousandth normal), and it is an advantage to use a smaller beaker (50 c.c.) and a smaller flask (100 c.c.) and funnel for the iodine. As the dilute solutions do not keep well they should be prepared fresh as required.

For most cases of glycosuria and for normal persons 0·2 c.c. of blood is used, but when a very high blood sugar is expected (over 0·35 per cent.) only 0·1 c.c. should be taken. These quantities may be readily obtained from a prick with a needle, especially if the thin and comparatively insensitive skin at the root of the finger-nail is selected and the finger is congested by swinging the warm hand in a dependent position for a few moments and then constricting the finger with a narrow bandage or rubber tube. It is hardly necessary to point out that an accurately graduated pipette of narrow bore should be used for measuring the blood, and that any excess adhering to the outside must be carefully wiped off when the required quantity has been drawn up into the pipette. In order to remove the albumin from the blood and secure a solution suitable for sugar estimation, it is laked by mixing it with a known volume of deci-normal acetic acid (1 c.c. of glacial acetic acid to 125 c.c. of distilled water), made up to a definite volume with a saturated solution of sodium chloride, boiled, cooled, and filtered. An aliquot part of the clear filtrate is employed for the sugar estimation.

The details of the method are as follows:—

Exactly 3 c.c. of deci-normal acetic acid are placed in a clean test-tube and 0·2 (or 0·1) c.c. of blood is added, the pipette being washed out with the acetic acid two or three times by suction. The mixture is allowed to stand for at least five minutes and subsequently made up to 10 c.c. by adding exactly 6·8 c.c. (or 6·9 c.c. if 0·1 c.c. of blood was used) of clear saturated sodium chloride solution. The test-tube is now placed in a bath of boiling water for a minute or two, then cooled in running water, and its contents poured on to a small dry filter paper (5·5 cm. diameter). As the clot is apt to slide out of the tube suddenly and cause the solution to overflow the filter it should be broken up previously by tapping the tube against the finger. The first few drops of the filtrate are generally turbid and should be returned, as an absolutely clear filtrate is required.

When a sufficient amount has come through exactly 7·5 c.c. are measured with a pipette into a small beaker containing 1 c.c. of modified Benedict solution and 1 c.c. of saturated sodium carbonate solution. The beaker is covered with a watch-glass, placed on a wire-gauze over a Bunsen flame, and its contents gently boiled for exactly three minutes. The flame is then removed and 2 c.c. of pure hydrochloric acid (sp. gr. 1·16) are cautiously added. The solution is at once poured into a thistle-funnel-flask containing 25 c.c. of distilled water and 20 c.c. of thousandth normal iodine solution, the same precautions as to mixing, &c., being taken as in the urinary sugar determination. The beaker is washed out with 2 or 3 c.c. of hot distilled water and the washings poured into the funnel. The liquid adhering to the stem of the funnel having been washed into the flask with distilled water, the iodine is titrated with standardised thousandth normal sodium thiosulphate solution, using 3 drops of freshly prepared cold starch solution (about 1 per cent.) as the indicator when the brown colour of the iodine has been almost discharged. The end-point is shown by the disappearance of the last faint trace of blue, or purple, with a resulting colourless solution when the flask is examined against a dead-white background by diffused daylight; artificial light does not give satisfactory results. In warm weather it is advisable to cool the flask in running water before titration, as the last trace of blue is then more readily seen.

A control titration with 25 c.c. of distilled water and 20 c.c. of thousandth normal iodine is carried out for each blood or consecutive series of bloods, and the end-point carefully matched. The difference between the number of cubic centimetres of thousandth normal thiosulphate used for the test and for the control multiplied by 0·0203 (or 0·0406 if only 0·1 c.c. of blood was used) gives the percentage of sugar in the blood. The same method may be employed for determining the sugar content of cerebro-spinal fluid, &c.

These methods have been in daily use in my laboratory for over a year. I find that they are reliable, and are economical of time and material as compared with others previously employed. The modified Benedict solution, which keeps indefinitely unchanged, avoids most of the fallacies of Fehling's solution, and may be employed for both qualitative and quantitative work. The end-point of the urinary sugar determination is definite and easily recognised, even by artificial light, so that satisfactory results can be obtained with very little practice, and the whole process is so simple that it can be readily learned. The use of the same reagents and apparatus for the urine and blood is a considerable advantage from several points of view, and not least that comparable data are secured. As only a small amount of blood is required for each estimation several examinations of the same patient may be made on one day, if necessary, without discomfort. This is a matter of no small importance since the sugar content of the blood is now recognised to be of greater value in the diagnosis and treatment of diabetes than a determination of the output of sugar in the urine.

Nottingham-place, W.

DEATH OF MR. JOHN KING.—The death occurred at his residence at Stratton, Cornwall, on April 11th, of Mr. John King, L.R.C.P. Edin., M.R.C.S., L.S.A., J.P., in his 72nd year. He belonged to an old Cornish family who have practised in Stratton for many generations. He succeeded to his late father's practice nearly 50 years ago, and was for a long time medical officer of health for Stratton and Bude. It is mainly to his efforts that those towns have an efficient sewerage scheme, and he worked hard to secure the excellent water-supply which Bude now possesses. He was a justice of the peace for Cornwall.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ANÆSTHETICS.

Anæsthetics at a Casualty Clearing Station.

A MEETING of this section was held on Feb. 2nd, Mr. GEORGE ROWELL, the President, being in the chair.

Captain GEOFFREY MARSHALL, R.A.M.C., read a paper on Anæsthetics at a Casualty Clearing Station. He showed that owing to the circumstances under which operations are performed at clearing stations the correct choice of anæsthetic often determines the patient's chance of recovery or the opposite. He discussed the choice as it affects the lightly wounded, those seriously wounded, and those suffering from serious sepsis. For the first class either gas and oxygen or an induction by warm ether and chloroform vapours was employed, warm ether being continued with. He showed that an investigation of the blood was an all-important step towards securing the right anæsthetic for those suffering severely from recent wounds. If there was a hæmoglobin percentage of less than 100, showing that the blood was dilute and that blood had been lost, then the use of stovaine by spinal injection was almost certain to be associated with serious fall of blood pressure and symptoms of collapse, and might lead to fatal results. The blood diminution did not produce the same effect if 40 hours or more had passed since the infliction of the injury. The conclusions as regards spinal analgesia were gathered mainly from consideration of 50 cases in which the hæmoglobin percentage, blood pressure, and pulse-rate were recorded before the injection of stovaine. Keeping the head low was found to be the most important step in preventing or combating collapse, and this position should be maintained for an hour after the return to bed. Intramuscular pituitrin was found of little use and intravenous saline gave only temporary help. Intravenous ether also did not give good results in the case of the shocked and recently wounded. Captain Marshall found gas and oxygen the most satisfactory anæsthetic for wounds of the limbs of extreme severity, and warm ether vapour for abdominal cases and for head cases. For chest cases and mixed chest and abdominal cases warm chloroform vapour with oxygen proved the most satisfactory agent; in the latter instances it was best preceded by injections of morphia, scopolamine and atropine. Collapsed patients received intravenous saline towards the close of the operation.

The paper was discussed by Colonel HUGH RIGBY, who had seen much of the work on which Captain Marshall's paper was founded; by Mr. TYRRELL GRAY, who disputed some of Captain Marshall's conclusions upon spinal analgesia and blood pressure; and by Mr. Z. MENNELL, Mr. H. E. G. BOYLE, and Mr. H. BELLAMY GARDNER.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

Sudden Death in Tabes Dorsalis.—Limitations of Vaccine Treatment.

A MEETING of this section was held on March 30th, Dr. H. C. DRURY, the President, being in the chair.

Dr. A. R PARSONS read a paper on two cases of Sudden Death in Tabes Dorsalis. The first, a man aged 41, had consulted him two years before complaining of some difficulty in walking and unsteadiness, noticed chiefly while washing his face. There was also slight trouble in micturition—at first difficulty in passing; later, some loss of control. Seventeen years previously he had a sore on the glans penis, but no other symptoms. His wife had had one miscarriage. He was a healthy man with the exception of his nervous system, which showed typical, if rather slight, signs of locomotor ataxia. Wassermann reaction was faintly positive. The case ran the usual course for two years, when one day at dinner the patient, who during the day had been in his usual good general health, suddenly changed colour, and when examined was found to be dead. The second case was similar, death occurring suddenly during a game of bridge. In neither case could an autopsy be obtained, but frequent careful physical examination during life showed no evidence of arterial disease, and this could almost certainly be excluded. He considered the most probable explanation of death to be "cardiac crisis," a condition almost entirely overlooked in text-books, but mentioned by a few authors, notably Gowers and Osler —In the discussion which followed the PRESIDENT thought that, in the absence of previous anginal symptoms, it was questionable whether death could fairly be ascribed to cardiac crisis. In several cases of sudden death Professor P. T. O'Sullivan had, he said, found as the only recognisable lesion a sclerotic or atheromatous condition of the aorta about the openings of the coronary arteries.—Sir J. W. MOORE suggested that death was more probably due to brain mischief, e.g., cerebral hæmorrhage.—Dr. PARSONS, in reply, said that as far as was possible by clinical examination arterial disease had been excluded. Death was, he thought, too sudden in both cases to be explained by cerebral hæmorrhage.

DR. R. J. ROWLETTE read a note on the Limitations of Vaccine Treatment. He spoke of the difficulty in general of judging of the value of a particular method of treatment, increased in the case of vaccines by the fact that treatment had been allowed to remain largely in the hands of men without clinical experience. In preventive treatment, the case for vaccines was now admitted, particularly in view of the experience of the present war. In curative treatment the efficiency of vaccines was limited by the power of reaction of the tissues. Moreover, while vaccines could stimulate the tissues to resist an active infective process, they had no power to restore integrity of the tissues after infection had ceased. Again, for vaccine treatment to be effective, accurate bacteriological diagnosis was a preliminary requisite. There was no incompatibility between vaccine treatment and the employment of other therapeutic methods, whether surgical or medical. Knowledge of the principles of immunity and of the practice of inoculation should in future be part of the instruction in therapeutics given in the medical curriculum.

Reviews and Notices of Books.

Organisation Physiologique du Travail. By JULES AMAR, Docteur ès Sciences, Directeur du Laboratoire des Recherches sur le Travail Professionnel au Conservatoire National des Arts et Métiers. With 134 illustrations. Paris: H. Dunod et E. Pinat. Pp. 374. Price 18 fr.

THIS volume represents part of the work which M. Jules Amar has been carrying on at the Conservatoire National des Arts et Métiers at Paris since 1912, and for its full understanding requires to be read in conjunction with his book "Le Moteur Humain et les Bases Scientifiques du Travail Professionnel." M. Amar has been inspired by the work of Frederick Winslow Taylor, an American mechanical engineer, who from an artisan became a factory owner. By effecting improvements in the tools and methods employed by his workmen the output of his works was very considerably increased.

In his "Principles of the Scientific Organisation of Work" Taylor complains that the physiologist has not paid sufficient attention to "fatigue." M. Amar has now remedied this omission. The volume contains a description of the various methods he employs to investigate "fatigue." The phenomena of the contraction of muscles are recorded by a dynamograph; the muscular force is conducted by a spring which presses on an indiarubber ball connected by tubing with a Marey's tambour provided with a writing style which registers on a revolving cylinder the amplitude of the movements of the muscles. Dynamographs are fitted to various tools, including the file, plane, and shovel; the force, rate, and precision of the movements involved in their use can thus be registered. The energy expended is determined from the consumption of oxygen during respiration; to measure this he uses a eudiometric apparatus attached to a respirator fitted over the workman's mouth. Deductions are

made from cardiograms and pneumograms; curves are made of the variations of pressure of the expired air; the ratio of the duration of expiration and inspiration affords useful data. The ergometric (bi)cycle serves to measure the fatigue of the legs and arms; M. Amar's modification of the Mosso chirograph is used to investigate the fatigue of the muscles moving the fingers or wrist; the *poire dynamographique* (a hollow indiarubber ball fitted with air, the pressure of which can be varied), measures the grasping power of the hand; the arthrodynamometer measures the amplitude of movements of joints and the force of the muscles producing the movement.

In this book M. Amar does not go closely into the application of his principles to each of the various trades; he contents himself with urging that the use of his registering tools will indicate to the workman various faults which should be overcome. He emphasises the advantages of the correct position to assume when using a file; the cinematograph, he suggests, will indicate this position and help to eliminate any unnecessary actions during work. But the author gives a complete account of the adaptation of his methods for the functional and professional re-education of crippled soldiers; not only this, but he works out in a convincing manner the scientific principles of artificial limbs. By means of his dynamographic platform he analyses the movements of artificial legs, and is able to indicate the models which most nearly allow of the reproduction of the normal movements during walking. He gives a description of the various forms of artificial limbs he considers most useful both for the workshop and office. An account of his *pince universelle*, *anneau universelle*, and hook is included. He is an advocate for fitting elaborate mechanical hands even to men who have suffered an amputation at the shoulder, when the movements of the hand are produced by the expansion and retraction of the chest wall during breathing. A wide difference of opinion exists in France as to the value of such elaborate appliances. M. Amar's results lends support to those in favour of them. Possibly their provision is justified when limited to selected men of better education whose work is of a light nature and who are prepared and in a position to go to a certain amount of trouble to keep their appliances in order.

The book is written for the French general public. M. Amar has therefore included matters of interest primarily to Frenchmen as well as elementary physiological considerations. When dealing with general matters he is somewhat diffuse, but no such fault can be found when he gives us in book form the papers he has written on his own work. The book is the work of a pioneer and patriot, who is evidently gratified that the direction his life's work has taken has suddenly become of immediate value to the crippled defenders of his country.

JOURNALS AND MAGAZINES.

Journal of Physiology. Edited by J. N. LANGLEY, Sc.D., F.R.S. Vol. LI., Nos. 1 and 2. Cambridge University Press. 1917. Pp. 1-110. Price 8*s*.—On the Summation of Propagated Disturbances in the Claw of Astacus, and on the Double Neuro-Muscular System of the Adductor, by Keith Lucas. A melancholy interest attaches to this communication, for it is the last contribution to physiology made by that assiduous observer, Dr. Keith Lucas, who at the early age of 37 died on Oct. 5th, 1916, as the result of an aeroplane accident. There seem to be two separate neuro-muscular systems belonging to the adductor muscle—one for the slow movements of the claw and one concerned only with rapid closing. If the nerve to the adductor muscle is excited with a single stimulus the muscle may give either a small, slow contraction or a quick twitch according to the strength of the stimulus used. The excitable substance whose stimulation leads to the twitch has the shorter excitation time and needs the stronger current if the current duration is long. Richet described the summation phenomena in the claw of astacus, which belong to the type of "summation of propagated disturbances," in which the first stimulus, though apparently ineffective, does send an impulse down the nerve. The impulse fails to cause a contraction of the muscle, but ensures the success of a second impulse following it at a suitable interval of time.—The Excretion of Urea and Sugar by the Kidney, by Arthur R. Cushny. The commonly accepted view is that urea is a specific constituent of the urine and that a specific secretory activity is required for its excretion, which does not seem to be required in the same way by the inorganic salts. The physical properties of urea do not appear to justify its being treated as apart from the other constituents of the urine. The concentrations of sulphates in the blood and urine bear an almost equal ratio with those of the urea, and the same is true of the inorganic phosphates and creatinin. Even sugar, when it escapes by the kidney, may undergo a concentration of from 0·2 per cent. in the blood up to 10 per cent. or more in the urine, and thus nearly rivals urea in extent of change. The only sense in which urea can be accorded a special position in the urine is that it is normally present in large amount. Heidenhain drew an analogy between the excretion of sodium sulphindigotate and that of urea. His views, however, in regard to the passage of dyes through the kidney epithelium can hardly be maintained against the fact that dyes appear in the urine long before they occur in the interior of the cells, and that the maximum of staining of the epithelium takes place after the greatest concentration of the urine has passed off. Still, the view is widely held that the concentration of the urea takes place in the tube cells quite independently of the activity of the glomerular capsule. The author repeated Heidenhain's experiments, substituting chemical estimation of the urea in the kidney, finding that: 1. When the spinal cord is severed no accumulation of urea occurs in the kidney, and, similarly, phloridzin ceases to cause accumulation of sugar. 2. Urea and sugar thus are not excreted in the way Heidenhain describes for the sulphindigotate of sodium, and all conclusions drawn from this analogy are erroneous. The site of secretion for urea and sugar therefore remains undetermined, and experiments on mammals offer no grounds for supposing that it differs from that of the other constituents of urine.—On the Localisation of the Calcium and Potassium Salts concerned in the Mediation of the Action of the Vagus Nerve on the Heart of the Frog, by W. Burridge. 1. Faradisation of the base of the frog's ventricle gives effects predominantly inhibitory when the heart contains blood and effects predominantly excitatory when the heart contains Ringer's solution. 2. After treatment of the perfused frog's heart with potassium salts the capacity to be inhibited from the vago-sympathetic trunk is lost and the capacity to be inhibited by the faradisation of the local nervous mechanism is regained. 3. The capacity to be inhibited from the vago-sympathetic trunk following treatment with potassium is restored by calcium. 4. It is suggested that calcium salts mediating the action of the vagus nerve on the frog's heart form an integral part of the structure, whatever it may be, on which nicotine acts. 5. The potassium salts concerned in vagus action are situated at the "nerve-endings" in the muscle.—Some Observations on the Action of Guanidine on Frog's Muscle, by John S. Meighan. Other observers have studied the effects of this base and its neutral salts. The spontaneous twitches it evokes in frog's muscles are less with higher than lower concentration of guanidine solutions. Its "curare," or paralysing, effect on nerve-endings in muscle seems to be due not to its action on muscle fibres, but either on the nerve-endings or on the "receptive substance" supposed by Langley to exist in proximity to the endings. A moderate rise of temperature (5° C.) increases its effect, but a great rise (25° C.) does not completely destroy it. The effect of cooling seems doubtful.—The Volume of the Dead Space in Breathing and the Mixing of Gases in the Lungs of Man, by A. Krogh and J. Hindhard. After a historical account of the measurements of the bronchial tree of a corpse (=140 c.c.) by Zuntz and Loewy in 1904, and the sampling of alveolar air by Haldane and Priestley's method (1905), and by other observers, the authors state that there is a clear and debatable issue between Haldane—who maintains that the dead space is a physiological and not an anatomical conception—and their own views. They hold that the air in the air-sacs (as well as in the atria) is not at the end of inspiration of the same composition throughout, because the air inspired is incompletely mixed with the air previously contained. The mixing takes place chiefly by diffusion, and requires a certain time. We must refer the reader to the original text for the methods used. The following are the authors' conclusions: 1. Just after inspiration the gas mixture in the lungs beyond the dead space (the alveoli taken in the widest sense of the term) is not uniform throughout. The differences are

usually slight, but with deep and slow breathing they become considerable. With deep and rapid breathing, as in muscular work, the mixing seems to be again improved. 2. In attempts to determine the dead space of the air passages these facts must be taken into account if reliable results are to be obtained. The very large dead spaces determined by Haldane and by Henderson and his collaborators are unreal. 3. The dead space of a human subject is constant at pulmonary inflations below the resting position of the chest. At larger inflations it increases gradually. With a maximum inflation of the lungs the increase may amount to 100 c.c. 4. No evidence has been obtained of any unequal ventilation of different lobes of the lungs. 5. The composition of the alveolar air should in most circumstances be determined preferably by calculation from the expired air, the volume of the expiration, and the dead space, When the breathing is deep the resulting increase in dead space should be taken into account, but during muscular work very slight errors only will usually result from not doing so, because the increase is small compared with the depth of respiration. The direct sampling, according to Haldane and Priestley, has in certain cases given rise to fallacious results. 6. Our method of examining the composition of the alveolar air by a series of consecutive samples from the same breath is open to objections. The errors are probably not large. 7. The errors caused by incomplete mixing of the pulmonary gases in our circulation-rate determination are much too small to be perceptible in experiments on normal lungs.—The Mechanism of Cardiac Acceleration by Warmth and by Adrenalin, by C. Lovatt Evans. Much work has already been done in this direction by using the heart-lung preparation of a mammal as devised by Starling. The factors which tend to diminish or increase metabolism and the efficiency of the heart are considered, analysed, and tested experimentally. It was found that: 1. The oxygen usage per beat, although approximately constant over small ranges of temperature in the neighbourhood of the normal body temperature, is increased at either extreme of temperature. 2. The cause of increased metabolism at abnormally low temperatures appears to be dilatation of the heart with increase of the active surface; other factors are operative in both increasing and in diminishing this effect, the resultant only being apparent. Similar considerations apply to the raised metabolism at high temperatures. 3. The effects of adrenalin cannot be traced to such purely mechanical factors; the increased metabolism is apparently due to a direct and specific effect in increasing and accelerating the chemical changes associated with contraction.—The Relations of Carbon Dioxide in the Blood, by George A. Buckmaster. Very conflicting views are held concerning the state in which carbon dioxide exists in blood. The statement of Pflüger in 1864 that a constituent of blood is capable of liberating carbon dioxide from the carbonates of that liquid is mentioned in most text-books on physiology. The author was led to doubt whether a carbonate could possibly be decomposed by hæmoglobin or any protein or amino-acid of the blood. If this view is found to be experimentally correct, then the total liberation of CO_2 from blood cannot be due to a protein. It was found that neither hæmoglobin nor, indeed, any other constituent of the defibrinated blood is capable of freeing CO_2 from sodium carbonate, and the same is equally true for solutions of the bicarbonate. The author attributes any CO_2 which is evolved as being dependent on the development of acidity in the blood.

Maternity and Child Welfare. Vol. I., No. 3. London: John Bale, Sons, and Danielsson, Limited, 83–91, Great Titchfield-street, W. 1. Price 6*d.* net.—The third number of this useful periodical contains interesting articles by Lady Barrett, M.D., on the Midwife and her Share in the Protection of Motherhood; by Dr. Amand Routh on the Ordinary Diseases of Women which may Affect Pregnancy; and by Mr. N. Bishop Harman on Ophthalmia Neonatorum. Shorter articles on Infant Welfare Centres, Food Values, and the Training of Health Visitors are also included, while the Annotations and Abstracts and Notes give summaries of some of the problems facing the medical and social worker among mothers and children and the attempts that are being made to solve them. The idea of publishing sectional maps of the British Isles showing the distribution of infant welfare centres, and the extent to which the work of each is developed and the amount of municipal help obtained, is a real inspiration. This magazine is "edited in the interests of the mother and young child by a member of the medical profession, with the help of an advisory committee representing the various groups of workers," and is an excellent example of a form of literature for which there is much need. The articles are written by experts from a scientific point of view, but in such language as to be perfectly intelligible to the voluntary worker (usually a layman) as well as to the nurse or health visitor.

The Child. Vol. VII., No. 6. March, 1917.—This number contains an important paper by Dr. M. F. Boulenger on the management of the exceptional child in Belgium. Before the war Dr. Boulenger was medical director of the farm-school for abnormal children at Waterloo (Belgium), and is now occupying a temporary post at the Darenth colony for defective children in Kent. Abnormal children in Belgium were until 25–30 years ago accommodated in the lunatic asylums, while the first special institutions were prison-like buildings, without classrooms or workshops, surrounded by treeless, macadamised airing-courts. In these wretched places children with faulty habits were tied all day on commode-chairs, lying at night on mattresses reeking of ammonia. All this was changed by the pioneer work of two physicians who had studied pedagogy previously to their medical graduation, Professor Jean Demoor and Professor Auguste Ley, who, between 1900 and 1906, were the means of founding centres for special education in Brussels and Antwerp, and later in Ghent, with after-care associations which arranged for the apprenticing of the boys and girls on leaving school. The Société protectrice de l'Enfance anormale, with the late Minister of Justice, M. Jules Lejeune, as its president, was successful in obtaining, by its active propaganda, special tribunals for juvenile delinquents. Dr. Boulenger himself put forward the idea of the farm-school in 1901 and pavilions were being erected on a large site in the province of Brabant when war broke out. Temporary courses for teachers had, however, already been given in the province in 1914. Dr. Boulenger generously acknowledges the influence of French and English ideas on his Belgian work: he was himself a frequent visitor at the special schools in this country and looks forward in confidence, with the resumption of Belgian national life after the war, to further rapid development in his own country of the care and training of abnormal children.

Reports and Analytical Records
FROM
THE LANCET LABORATORY.

THE WHITE WINES OF ANJOU AND TOURAINE (FRANCE).

(ALEXANDER WOOD, CAMPBELL, AND CO., 62, CRUTCHED FRIARS, LONDON, E.C.)

FOR medicinal or special dietetic purposes in which a light agreeable stimulant seemed desirable a preference has long been given to the German white wines of the hock and Moselle type (still and sparkling). They were chosen for their low alcoholic strength, their freedom from colouring matter, their small sugar content, and their low degree of acidity. But according to a recent examination we have made of some specimens, it is quite evident that certain of the French white wines answer these requirements equally well. The white wines, in fact, of Touraine and Anjou are in some respects better. They are light, elegant, and practically non-acid. We have received some 20 examples of these wines, a few of which we have submitted to analysis as giving a fair idea of their general composition and quality.

(1) *Touraine Supérieur* (still):—Alcohol by volume, 11·61 per cent.; extractive matters, 2·55 per cent.; mineral matter, 0·25 per cent.; sugar, 0·27 per cent.; volatile acidity reckoned as acetic acid, 0·12 per cent.; fixed acidity reckoned as tartaric acid, 0·82 per cent.

(2) *Anjou Supérieur* (still):—Alcohol by volume, 9·86 per cent.; extractive matters, 1·55 per cent.; mineral matter, 0·20 per cent.; sugar, 0·26 per cent.; volatile acidity reckoned as acetic acid, 0·09 per cent.; fixed acidity reckoned as tartaric acid, 0·86 per cent.

(3) *Vouvray tête* (still) :—Alcohol by volume, 12·05 per cent.; extractive matters, 2·40 per cent.; mineral matter, 0·20 per cent.; sugar, 0·45 per cent.; volatile acidity reckoned as acetic acid, 0·15 per cent.; fixed acidity reckoned as tartaric acid, 0·71 per cent.

(4) *Touraine Supérieur* (sparkling) :—Alcohol by volume, 8·18 per cent.; extractive matters, 5·35 per cent.; mineral matter, 0·15 per cent.; sugar, 3·33 per cent.; volatile acidity reckoned as acetic acid, 0·06 per cent.; fixed acidity reckoned as tartaric acid, 0·67 per cent.

(5) *Anjou Supérieur* (sparkling) :—Alcohol by volume, 12·05 per cent.; extractive matters, 5·54 per cent.; mineral matter, 0·14 per cent.; sugar, 4·16 per cent.; volatile acidity reckoned as acetic acid, 0·07 per cent.; fixed acidity reckoned as tartaric acid, 0·65 per cent.

(6) *Vouvray tête* (sparkling) :—Alcohol by volume, 13·43 per cent.; extractive matters, 4·49 per cent.; mineral matter, 0·19 per cent.; sugar, 2·50 per cent.; volatile acidity reckoned as acetic acid, 0·12 per cent.; fixed acidity reckoned as tartaric acid, 0·51 per cent.

These results bear out fully the claims that these French wines are, in regard to special dietetic requirements, not at all inferior to the German produce, and in certain respects they are superior. This, at all events, is the case in regard to a minimal amount of sugar, alcohol, and especially of volatile acid in the still wines, while the higher proportion of sugar in the sparkling wines is due to "liqueuring." These points may well deserve attention now that the supply of German white wines is cut off.

ANTIPHLOGISTINE.

(THE DENVER CHEMICAL MANUFACTURING CO., NEW YORK. LONDON AGENCY: ST. ANN'S-ROAD, BOW, LONDON, E.)

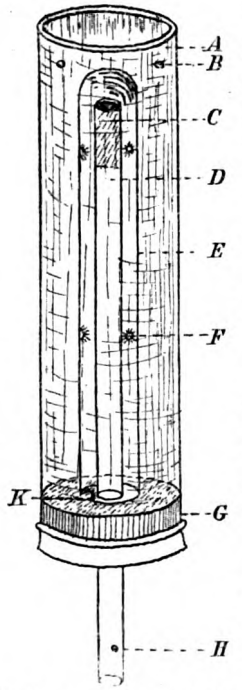
Antiphlogistine has been well described as a scientific mud which is externally applied hot and thick as a cataplasm for the relief of inflammatory and congested conditions. In connexion with its application for this purpose we have already referred to this preparation, which is composed of a finely refined earth compounded with glycerine, iodine compounds, boric and salicylic acids, and certain antiseptic essential oils. We are now informed that a poultice of hot antiphlogistine applied to the nose relieves the "stuffed-up" feeling so often characteristic of the common cold. In rhinitis and coryza favourable results are recorded. Applied over the nose in the case of a common cold at bed-time, the patient is said to secure relief of the distressing symptoms, a restful night, and a general feeling of well-being in the morning. The combined application in this way of heat along with antiseptic oils, and the like, may well produce an alleviation of such troubles.

New Inventions.

AN AUTOMATIC INTERMITTENT WOUND IRRIGATOR.

THE apparatus was originally intended for the intermittent irrigation of deep and infected wounds, and more especially of such wounds as are associated with compound fractures. In dealing with these wounds a mode of treatment associated with the name of Carrel has received general use and recognition. This treatment essentially consists in introducing into the crevices of the wound a number of rubber tubes each of about $\frac{1}{8}$ inch diameter; gauze packing is lightly introduced into the wound around the tubes. At regular intervals the tubes are irrigated through with a solution of eusol.

FIG. 1.



Syphon-action irrigator. Lieutenant Dunn's modification. *A*, outer glass tube; *B*, holes for suspending vessel; *C*, paraffined top of tube; *D*, inner glass tube; *E*, inverted test-tube; *F*, pinchings in test-tube to keep inner tube in position; *G*, rubber cork; *H*, air-valve; *K*, inlet in lower border of test-tube.

Hitherto the irrigation was secured by regular manual irrigation with a syringe. This method involved a considerable waste of time, much disturbance of the patient, and frequently the inducing of pain and irritation. This apparatus was produced with a view to overcoming these disadvantages, and its origin is largely owed to Corporal Studd, R.A.M.C. The apparatus embodies two simple mechanical principles: (1) The property possessed by two adjacent and connected fluids of finding a common level; (2) the principle of the simple syphon.

The original model (A) was composed of an outer glass tube and an inner bent tube. As the outer jacket filled with fluid, the fluid rose to a corresponding level in the open limb of the inner bent tube, and when the bend was reached the syphon action was commenced and the outer tube emptied of fluid. A simple air valve in the efferent limb of the bent inner tube obviates the occurrence of an air block.

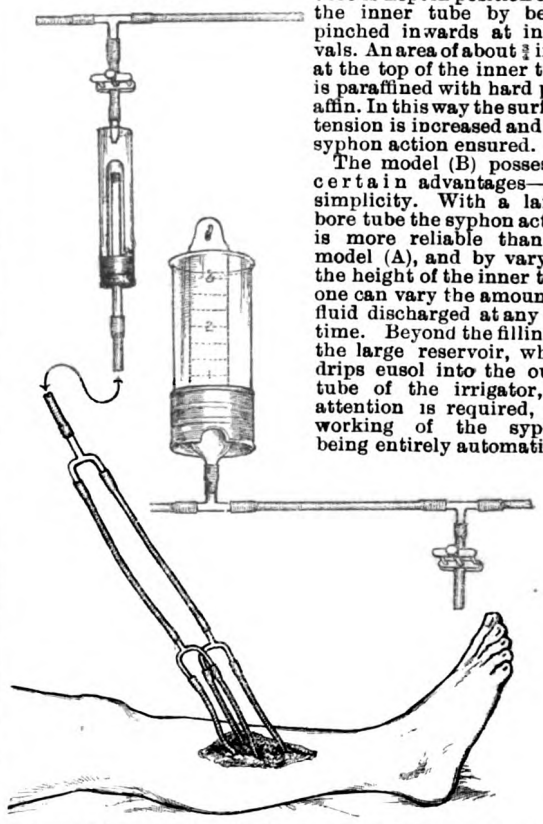
The times at which the irrigation will occur can be regulated by varying the rate at which the drip feed of eusol from the reservoir flows into the outer tube. The interval will be the time which the fluid takes to reach the level of the bend. The efferent tube is connected up by Y branches with as many of the rubber tubes as are required for the irrigation of the wound.

Lieutenant Dunn, R.A.M.C., No. 3, Mobile Laboratory, has produced a modification of the original model, and has kindly given us permission to include the description of the modification. The apparatus is shown in Fig. 1.

A syphon is made by inverting a test-tube over a straight inner tube, and inlet is furnished at the open inverted end of the test-tube. The test-tube is kept in position over the inner tube by being pinched inwards at intervals. An area of about $\frac{3}{4}$ inch at the top of the inner tube is paraffined with hard paraffin. In this way the surface tension is increased and the syphon action ensured.

The model (B) possesses certain advantages—its simplicity. With a large-bore tube the syphon action is more reliable than in model (A), and by varying the height of the inner tube one can vary the amount of fluid discharged at any one time. Beyond the filling of the large reservoir, which drips eusol into the outer tube of the irrigator, no attention is required, the working of the syphon being entirely automatic.

FIG. 2.



Showing the method of distribution of the fluid, from a central reservoir which may supply a number of irrigators.

It should be added that the tubes leading from the syphon should be made as perpendicular as possible, and that the cross section of the distal tubes should not be more than that of the proximal ones.

An apparatus employed has been found easily adaptable to beds for the suspension and direction of the irrigator. The height, angle, or position of the irrigator can be variously altered.

J. FRASER, M.D., F.R.C.S.Edin.,
Captain, R.A.M.C.
S. D. STUDD, Corporal, R.A.M.C.

THE LANCET.

LONDON: SATURDAY, APRIL 21, 1917.

The Centralisation of Public Health.

THE Food Controller continues to issue recommendations with regard to limitation of our food consumption, implying that further drastic limitation is advisable or even, under the circumstances, necessary. Wheaten flour is his most serious concern at the moment, and every patriotic citizen is adjured to reduce his use of this staple article of diet, in whatever form, by 1 lb. per week. But there is no certain conviction in the public mind that these and other recommendations are consistent with the physical health of the community. No authoritative statement is issued, whether in fact they entail a reduction in mere eating which will be of advantage to the majority of us, or whether, under stress of necessity, we are to enter on a period of slight under-nourishment, with corresponding but inevitable loss of working efficiency. Medicine knows well enough that desire for food is not a fair guide to the individual as to his need for food intake, but the public should be told this and similar generalities by someone in authority. These and other kindred matters need, at the moment, intensive study by experts, who are in a position to make their pronouncements effective. Doubtless there is expert medical opinion at the disposal of the Food Controller's Department, but it is questionable whether the powers of that bureau are sufficient to give effect to the wide-sweeping recommendations necessary; in fact, here and immediately we come upon an urgent ground for the centralisation of public medical matters in a Ministry of Public Health.

The six State Departments which have at present duties to discharge in connexion with the people's health are the Home Office, the Local Government Board, the Board of Trade, the Board of Agriculture, the Board of Education, and the National Insurance Commission, to say nothing of Somerset House, which has charge of vital statistics, and the Food Controller's Department. Those familiar with the medical aspects of legislation in the making will remember how naturally it has come about that so many different State Departments are concerned. Assuming that our readers know the particular medical work for which the various Departments stand guardian, they will realise that if any one of these Departments is to take over the mass of the duties of the other five it will be either the Local Government Board, having the sanitary administration of the country under its control, or the National Insurance Commission, having for its charge the care in sickness of 14,000,000 subscribers, whose needs are administered to by a large proportion of the available medical men on the professional roll. If a new State Department be not especially created it will be necessary to reform or adapt one of these two for the conduct of enormously increased labours. Each has strong claims, the Local Government Board as the bureau of preventive medicine under the existing system, and the National Insurance Commission, already actively engaged in medical treatment and in the furthering of scientific progress through its Medical Research Bureau. There is between the two bodies but little overlapping or disputed territory of influence, so that a junction could take place without dislocation of public business; it could be of the loosest possible nature in the beginning and designed merely to obtain for the health of the nation one presiding force, and a centre around which later activities would be grouped.

Failing the creation of a new department, which we should prefer but which at the moment can hardly be looked for, we think that the cause of medicine, and therefore the welfare of the country, would be best served by constituting the Local Government Board the central authority for the health of the people. Its existing functions are closely connected alike with medicine and with the life of the people, so that any other health organisation acting independently from it would be in perpetual contact with it, and the delays and expenses following upon recurring discussions might largely counterbalance the advantages to be derived from the possession of a central authority. The Unionist Social Reform Committee, whose recent valuable pronouncement upon the health of the people we reviewed last week, arrived at a similar conclusion, and we add to the reasons for their faith, which are so excellently adduced in their report, a further one, for it may have real weight. The Local Government Board is heavily burdened with multifarious responsibilities towards the State, and there is sound reason for believing that once the central office for the health of the people, organised under its ægis, were grown vigorous under its far-reaching influence, separation would quietly occur, and a new Health Department would take in the public mind its proper position as one of the great Government bureaux. A separation of the Department of Health from the Local Government Board, which took place in this way, would have the advantage that to the separating body there would be naturally adherent, as a sequence of the past association, all those medical activities which cannot now by some movement of violent readjustment be torn from the Local Government Board and handed to the National Insurance Commission, or any other body; while the surrender to the new Department by the other Government Departments of the medical cares, thrust upon them through well-meaning legislation, designed to meet various wants as they made themselves felt acutely, would naturally follow. And of such a Department the National Insurance Commission, with the modifications in its working that are certain to occur in the course of time, would form one complete

side, linked by its Bureau of Medical Research to what is progressive in medical thought and to practical therapeutics by its responsibility for the medical treatment of a third of the population. With a great Department so constituted we need have no fear for the future of the general practitioner or for the health of the nation. No amount of centralisation or coördination can alter the fact that the individual sick person must be treated by the individual doctor, but the task will be carried out more efficiently as the care of the health of the people is better organised.

Bone Grafting.

WHILST bone grafting in the past has been rarely called for, and then chiefly to restore bones destroyed by osteomyelitis or new growths, the scope for its employment at the present day has been greatly widened by the injuries produced by gunshot wounds. It is, therefore, a matter of pressing importance to examine the facts underlying this procedure in order to estimate its possibilities and the best technique for securing success, and Mr. E. W. HEY GROVES, who has just received the Jacksonian prize for 1916, had good reason for taking this as his subject in the recent Arris and Gale Lectures delivered before the Royal College of Surgeons of England. It was, we believe, OLLIER who first demonstrated by experimental evidence the capacity of living osseous tissue for regeneration and the viability of whole and fragmented living bones when used as grafts. BARTH pointed out later that the rôle of even living bone grafts was largely passive, the graft itself possessing little osteogenetic power. AXHAUSEN, however, succeeded in showing that on all the free surfaces of a living graft, as also in some of its Haversian spaces, new bone was laid down, thus establishing the advantages of the living over the dead bone graft. MACEWEN carried further the principle of the viability of the bone cell, showing that this principle dominated the whole question of bone growth, the periosteum being a limiting membrane and the underlying osteoblasts the osteogenetic factor. It cannot, however, be said that the vexed question as to the functions of the periosteum has yet been finally settled. MACEWEN'S experiments, which have been confirmed by numerous observers, mostly in America, prove that it has no independent osteogenetic rôle, but there is considerable body of evidence to show that the structure is nevertheless of great value in the transplantation of bone. Probably under these conditions it acts as a vaso-conductor and as a matrix for new bone cells.

From a practical point of view, it is generally admitted that living autogenetic bone, with its periosteum if possible, should be used for grafting, but there are many points of detail which have been submitted to experimental study by HEY GROVES. A graft may be fashioned as a peg and used as an intramedullary bolt. This is a very unsatisfactory method. If the graft is driven tight it remains indolent and inactive or breaks and allows the fractured bone to be displaced. If it is loosely placed it will only establish vital relations when the bed in which it lies remains undisturbed by movement. In other words, two conditions essential for rapid vital success in bone grafting—viz., firm fixation and rapid vascularisation of the graft—cannot both be secured in the intramedullary method, which is, moreover, mechanically weak. On the other hand, living grafts rapidly establish vital union with a living bone bed, if they are fixed on to the cortex of the bone, so that they can be firmly attached and at the same time quickly acquire a blood-supply from the soft tissues around. In order to appreciate the conditions desirable for successful replacement of bone tissue it is essential to recognise that though living grafts may be viable, yet this viability is of a very limited character. The osteoblasts on the surface of the graft do under favourable circumstances proliferate. They contribute to that very narrow zone of new tissue which eventually joins the graft to its bed, and at a later period they may take part in the general increase in thickness which the graft undergoes. But for the most part the bone graft, whatever may be its source, is a passive agent, differing from a metal plate chiefly in the fact that it finally becomes a part of the living tissues. It has little or no capacity for rapid bone formation. If, therefore, it is to replace a part of the skeleton which is lost it ought to be as large and strong as possible, and very firmly fixed in its place. If living bone used as a graft could be made rapidly to produce new bone—i.e., callus—then the matter would be quite different from what it is. Then we should select a porous, vascular, cellular bone like a rib, divide it up into splinters or chips, laying these in the vascular bed where bone is lost, and keeping the part at rest for the same length of time as is required for the repair of a fracture, with the expectation of finding at the end of this time a regenerated bone formed by new callus. But this is exactly what does not happen. A graft simply laid loosely in soft tissues remains for a time and then slowly becomes absorbed. A graft firmly connected with living bone grows to it, but not for many months does it show active osteogenesis. The more a bone graft is divided up into chips the less certain is its survival or its growth. Bone chips laid in a thin layer on a raw bone surface may quickly become the centre of callus formation, but the same chips filling a large bone gap simply remain indolent or become absorbed, because the majority of them have no direct contact with the only kind of tissue which can support them. Even MACEWEN, who is responsible for the idea of the osteogenetic value of small bone fragments, admits that he could not make bone dust grow, though he attributes this to the injury of the bone cells by heating. Unfortunately, however living bone dust is produced, it is found to retain such feeble capacity for bone reproduction as to be quite worthless. The ruling factors appear to be these: the union of a living bone with its bed is at first by means of a cellular-granulation tissue which ossifies comparatively slowly. This union is always accompanied by a process of rarefaction of the adjacent

bone tissue, which whilst it lasts is a source of weakness. Therefore the first "taking" of the graft and its final incorporation with the skeleton will be greatly aided by the extent, the accuracy, and the firmness of contact between the old and the new tissues. If the part concerned is the spine or the skull, where little or no movement of the bone is possible, then correspondingly little suture is required. But if the graft is to fill a gap in a tibia, femur, or humerus, then mechanical fixation is a matter of the utmost importance. There has quite rightly been a reaction against the routine plating of fractures; but because metal plates and screws are only desirable as temporary suture agents there is no reason to ascribe to them an inhibitory influence on bone growth.

No doubt the most ideal bone grafting is that which, like the joiner's "dovetail" work, implies an exact fitting of one part into another so that no other fixation is necessary. But this is seldom possible in the repair of long bones. Fixation, then, should be by nails, screws, or wire, and, if the size of the bone will allow, by ivory pegs or bolts. The alternative to this is the use of animal ligatures only, supplemented by extensive plaster-of-Paris splinting. But this method is very insecure and uncertain in the case of the long bones, and the long immobilisation by plaster does everything to retard vascularisation and osteogenesis in the new tissues. The experimental comparison of dead and living bone-pegs, when these are used as nails driven into living bone, reveals the fact that they both behave in exactly the same way. The organic union between the peg and its bed seems to be as speedy and as firm in one case as in the other. There would appear, therefore, to be no object served by making bone nails for fixation purposes out of the patient's own tissues when ivory nails can be accurately prepared beforehand. In clinical practice all these principles are of the utmost importance. Grafts have to be carefully planned, fitted, and fixed if they are to give speedily successful results. Apart from the possibility of homoplastic grafting, which presents many practical difficulties, the best bone to use is the patient's own tibia, from the mesial surface or crest of which a long and strong graft can be prepared. It should considerably overlap the gap which it has to fill and be made to fit into slots in the ends of the bone to be repaired, and there fixed either by ivory bolts or nails or by wire.

But in the repair of gunshot wounds of bones, unfortunately, there are other elements which very gravely complicate the problem. These are latent sepsis, the injury of the soft parts, and the presence of large scars. For months after a wound has healed, especially that of a septic comminuted fracture, the tissues harbour the organisms of sepsis, which may flame into activity if the wound is reopened. To avoid this disaster a period of three to six months should be allowed to elapse before grafting, and by means of massage, active and passive congestion, the tissues may be either cleared of their infection or made to declare the presence of pyogenic agencies. In important cases it is, indeed, wise to do a preliminary operation for the clearing out of débris and the removal of scar-tissue, and to postpone the implantation of bone for another considerable interval unless this preliminary operation heals quite smoothly. Large superficial scars are a great source of danger. They will almost inevitably slough away after any plastic operation. Therefore either before or after any grafting operation such scars must be replaced by sound skin, and eventually the graft ought to be buried in muscle or fascia, so that it does not immediately underlie the skin wound. In its practical aspects bone grafting as applied to the treatment of gunshot wounds is so new and important that all surgeons engaged in this work should be urged to publish all their cases, bad and good alike, in order that a sound opinion and practice may result from their experience.

Professional Organisation among Medical Men.

WE are accustomed to hear from medical men that their profession is an unorganised body, and, therefore, at the mercy of the politician, who can always obtain his way from the whole by playing off some section against the others. We are equally familiar with the complaints made on political platforms, or even in the House of Commons, that the medical profession is such a perfectly organised ring that it can impose its will upon the legislature of the country. Of course, each statement is inaccurate, and when we say that a practical consensus of medical opinion has great weight, but that circumstances seldom elicit such a consensus, we have put the position in fairly correct terms. That this might well be so will, we think, be the opinion of our readers, when they study the section upon medical organisation, which will be published immediately in a supplement of the *New Statesman* dealing with professional associations. The authors of this section go very fully into a complicated story, and have succeeded in making it clear, though unfamiliarity with some of the details betrays them now and again into incorrect generalisations. The Medical Act of 1858, for instance, has never been transformed to include the ideals of the earlier medical reformers, for so far from creating one portal of entry to the profession, the number of portals have been steadily increased. A well-deserved compliment is paid to the energetic tactics of the British Medical Association, whose complicated machinery is carefully explained—so carefully that the analysis of the constitution will be useful, perhaps, to many of its members. The most interesting section is the one dealing with the relations of the doctor to the community, wherein the reasons dictating the professional attitude are well analysed and, we think, fairly handled, though in one or two places the particular difficulties of the medical man towards a public, which cannot be expected fully to appreciate the basis of his conduct or practice, are not brought out. We strongly recommend the whole article to our readers as forming a useful synopsis of their professional position, made from outside their ranks.

Annotations.

"Ne quid nimis."

THE PREVALENCE OF MEASLES.

MEASLES has interfered much with the amenities of civil and political life during the last few weeks, and there is a widespread impression that it has been more prevalent and more severe than in previous years. Within the compass of a single week 87 deaths from this disease have been recorded in London, 18 in Manchester, and 19 in Birmingham, while epidemics have been reported from most other large towns. School authorities have in many places been obliged to take action: infant schools in Dublin were closed early in March and several of the public schools in this country were obliged to take the same course. Measles presents indeed to the school medical officer a problem of much complexity which is likely to claim attention for some time. As was shown by Dr. J. H. Thursfield in the Local Government Reports for 1912–13, the serious pulmonary complications of measles are due to a mixed infection or one superadded to the primary infection. It is obvious that where large numbers of cases occur in an institution there is an increased opportunity for the individual case to find a secondary infection to which he is susceptible. Under these conditions a comparatively rare complication such as mastoid infection may become frequent in an institution where measles is prevalent and one such secondary infection present. To the school authorities it would be a great convenience if pupils arrived immunised against the disease in the only way at present known, that of having already had an attack. As 90 per cent. of the mortality from measles occurs in children under 5 years it is highly advisable to protect them from infection up to this age, although in the mortality from measles at any age it should be remembered that sanitary conditions play the leading rôle. In the year 1914 while the death-rate from measles per 1000 living for London as a whole was 0·31, that for Shoreditch was 1·02 and for Hampstead 0·02, or one-fiftieth of the mortality in the more crowded area. It has been estimated that in general the mortality from measles of children among the well-to-do classes is only one-fourth what it is in poor households. But whether children from the age of 5 to 10 years should be protected from sources of infection with the same care is a matter on which opinions may well differ. Unlike scarlatina, measles appears to be equally infectious at any period of life up to an advanced age. The chances of escaping exposure throughout life are remote, and the period of election might therefore, for many reasons, be the pre-school years. So acute has been the course of the disease amongst an entirely susceptible population, as in the classical examples of the Faröe and Fiji outbreaks, that some authors have assumed a degree of hereditary immunity among the general population handed on from parent to child. In harmony with this view is the admitted infrequency of measles in infants up to the age of 3 months, and a recent observation by Dr. Charles Herrman, of New York, that infants at a slightly greater age (3–5 months) contract the disease in such a mild form as to produce no effect on their weekly weight-chart. These characteristics of the epidemiology of measles demand further study, which should lead to an advance in our knowledge of the best methods of avoiding any considerable mortality. Prevention of the disease itself can, however, hardly be hoped for until the nature of the measles infection has been discovered.

BREAD ECONOMY.

AN exhortation to economy in bread is at the moment the Food Controller's message to the nation in regard to the food-supply. We are asked to reduce our bread ration and to forgo the use of wheat-stuffs at afternoon tea. It may naturally be asked how bread, which is commonly called the staff of life, can be replaced in the bodily economy. In considering this question we should remember the rôle of bread in the dietary, which is to supply the carbohydrate necessity in the daily intake. "Take care of the calories and the protein will take care of itself" is Professor Bayliss's adage, and it is clearly waste of time to discuss the value of bread apart from its carbohydrate content when substitutes of equal calorific value are available. Oatmeal, barley meal and flour, maize-meal and rice can be freely used without any apparent physiological disadvantage to replace or to eke out our supply of wheat flour. The view that wheat is an essential article of diet must therefore be regarded as ill-founded, a mere dietetic fetish. Other more available starchy foods should promptly come into general use, and the immediate desideratum is an earnest and practical study of the best and most palatable forms in which to present these substitutes on the table. If that were done by our cooks, bakers, and heads of families the idea of a physiological disaster might be put aside. The extreme importance of this simple temporary step should be universally realised, since its adoption may well mean the successful avoidance of great hardship, especially to the poorer parts of the community. The appeal to cut down the consumption of wheat flour should find a ready response from every patriotic individual in the land.

VOLUNTARY ACCELERATION OF THE HEART-RATE.

IT appears that there are a few individuals who possess the extraordinary capacity of voluntarily quickening the heart-rate; 13 instances in all have been recorded, and another is reported in some detail by Dr. John Favill (Chicago) and Dr. Paul Dudley White (Boston) in the current issue of *Heart* (vol. vi., No. 3, p. 175). The quickening commences almost immediately after the subject has willed it and one second after the word is given by the observer. The history of how such voluntary acceleration came to be acquired is interesting. There had never been any organic disease of the heart. At the age of 15 a quickened pulse-rate was noticed after mental excitement or physical exertion. Cross-country running about the age of 20 caused no cardiac symptoms even when seven miles were covered in 40 minutes. At the age of 22 the effort of climbing a small mountain sent the pulse-rate up to 190. Two years later the sensations which have since been found to accompany voluntary acceleration were induced for no known reasons and repeated occasionally in the following years. Two years after, in 1913, the power of voluntary acceleration was discovered by chance. It has been possible to exert this power ever since. Such quickening is dependent on a distinct effort of

will, and the strain is as tiring as that produced by holding up a heavy weight; it is not a succession of efforts but one that is continuous. Relief is felt with the cessation of the acceleration. During the quickening there is a feeling of fullness or tingling over the whole body. A mild exhilaration occurs for a few seconds, and moderate fatigue follows if the paroxysm is induced several times. The phenomena associated with the acceleration are as follows. The maximum increase in rate observed has been one of 96 beats, the rate changing from 104 to 200. An electrocardiographic record shows a quickening, on another occasion, of from 98 to 161. The least increase has been 30 beats. The maximum speed is reached after several beats have occurred; the high speed is maintained for a few seconds, then gradually descends to a normal rate. In the paroxysm the blood pressure is slightly raised, the pupils dilate, and some sweating occurs on the palms of the hands. The acceleration is suggested to be due, in great part at least, to the action of the accelerator mechanism and not chiefly to the withdrawal of vagal action, since acceleration can be induced even after atropine has been given, and since the character of the electrocardiographic curves during the quickening is similar to those which occur when the sympathetic nerves are experimentally stimulated. It is reported that this curious faculty has on two occasions been of service to its possessor. "Once in a condition of great fatigue in a hot operating-room, and again while watching cattle killed in a great packing plant for the first time, sensations of impending syncope were felt. On each occasion voluntary acceleration, with its rise of blood pressure, was induced and the feeling of faintness vanished at once." These observations are of interest as a contribution to the study of variations in the cardiac rhythm, and their publication may lead to the discovery of similar cases. The term "voluntary acceleration" remains in some sense a misnomer, unless conclusive evidence is present of a direct influence of the will upon the cardio-accelerator mechanism. In the case recorded the feeling of strain described suggests that some powerful voluntary contraction of muscles was involved to which the acceleration might have been a secondary or associated phenomenon.

SOME ESSENTIAL DIFFERENCES BETWEEN ANIMAL AND VEGETABLE FATS.

THE existence of accessory factors in various foods may be regarded as a well-established fact, and it is now becoming recognised that there is a considerable variety among these accessory foods. Experiment shows that young rats will not grow if fed on polished rice and butter, or on rice and wheat germ; while if both wheat germ and butter are added the diet becomes adequate. Milk contains both of these factors. There seem to be two groups of these substances; one is the "fat-soluble A" factor and the other contained in wheat germ is soluble in water, not in fat, and has been called the "water-soluble factor B." In a recent volume of the *American Journal of Physiology* (vol. xli., 1916) E. V. McCollum directs attention to the distribution in plants of the "fat soluble A," the dietary essential of butter fat. The question arises in view of the present consumption of margarine and other butter similars, whether any of the substitutes can actually replace butter in the diet. The question has been investigated in America by several observers and in this country by Halliburton and Drummond to ascertain whether the chief butter substitutes now upon the market contain the important fat-soluble A factor. Young growing rats were used, their dietary consisting of purified food-stuffs, such as caseinogen, starch, dextrin, sugar, the water-soluble B factor, together with the addition of the fat to be examined. A rat fed on such a diet with the addition of lard was eventually found to decline and die, but if the fat-soluble accessory substance A was added in sufficient amount and not too late, the life of the animal was saved and normal growth ensued. Some of the results may be summarised thus:—

"Oleo-oil" margarines.—In these the basal fat of low melting point "oleo-oil" is prepared commercially from beef fat. Osborne and Mendel in America showed that this commercial product contains the accessory factor associated with fats, and this form of margarine was found to be equal to butter fat in the nutrition of young rats. For vegetable oil margarines the basis is a cheap vegetable oil, e.g., coconut and peanut oil. Few, if any, of the chief vegetable oils—corn, olive, sunflower seeds, soy-bean, wheat, linseed, arachis, coconut and cotton-seed oils—contain the fat-soluble A. Rats do not grow to adult size when any one of these oils is the only fat present in the dietary. Margarines made from these oils are deficient in the important fat-soluble factor.

Vegetarian suet and lard substitutes.—Those examined were free from the fat-soluble factor; one was a deodorised coconut oil and the other a hydrogenated cotton-seed oil preparation corresponding to "Crisco," sold extensively in the U.S.A. as a lard substitute, but is a useless substitute for butter.

The points raised are obviously of great practical importance and their solution essential to the proper understanding of some of the food problems which the war has forced upon our notice.

A CASE OF POST-OPERATIVE TETANY.

Dr. H. W. Stenvers records[1] a case of tetany occurring after the operative removal of the thyroid gland, or tetania parathyreopriva, as it is sometimes called, in which relief of the symptoms was obtained both by the administration of parathyroid gland tissue by the mouth and by the transplantation of parathyroid glands. The patient, a girl aged 20, had shown signs and symptoms of exophthalmic goitre four years previously, and had had the right half of the thyroid gland removed at that time. Eighteen months later a second operation became necessary, and the other half of the gland was taken away. While the patient was still on the operating table she had a violent and painful attack of tetany. Ever since that time she had been subject to attacks of tetany, which were worst just before the menstrual periods; latterly the tetany had been so severe as to prevent her from working. When she came under the care of Dr. Stenvers she was thrown into a state of forcible and painful tonic spasm, most marked on the right side, by any sudden mechanical, optical, or auditory stimulus. The physical signs of Chvostek, Erb, and Trousseau, characteristic of tetany, were all well shown by the patient, particularly on the right side. Dr. Stenvers draws attention to the rapidity with which tetany followed the removal of the last of the parathyroid glands in this patient. As a rule many hours or days elapse before tetanic spasms occur in these cases, and a quotation from Marine is given to show that in dogs tetania parathyreopriva may develop in as little as seven hours. Dr. Stenvers concludes that after

[1] Nederl. Tijdschr. v. Geneeskunde, Amsterdam, 1917, i., 85.

her first operation his patient was living in a borderland condition of latent tetany. Discussing the treatment of this form of tetany, he notes that the daily exhibition of a few decigrammes of fresh parathyroid tissue from the horse gave his patient great relief. This was shown in three ways: firstly, the muscles became much less excitable to the interrupted galvanic current; secondly, the excretion of creatinine in the urine was lessened; thirdly, the general condition of the patient improved. The importance of creatinine in tetany is this, that the tone of the voluntary muscles is much increased in conditions in which the excretion of creatinine is increased. Before the parathyroid treatment Dr. Stenvers's patient was excreting about 13 decigrammes of creatinine daily, but during the treatment this figure fell to about 6 decigrammes. Dr. Stenvers notes that horses' parathyroid glands are hard to come by during the war; his attempts to make use of the parathyroids of pigs failed, apparently because he was unable to find these organs in the animals. The next step in the treatment consisted in the implantation of three parathyroid glands by Professor Laméris, taken from patients with exophthalmic goitre. The results were excellent; four months later the patient was still able to work, though no longer quite free from the tetanic spasms, and the urinary creatinine had risen to nearly 9 decigrammes a day. Three months later the girl was still at work and delighted with the result of the treatment; the tetany was present still, but painless.

THE INVENTOR OF ESPERANTO.

Lazarus Ludwig Zamenhof, whose death is announced at Warsaw on Saturday last, was 57 years of age and a native of Bialystok in Russian Poland. Of delicate health, he was intellectually precocious, reading and writing well at the age of four. In 1873 Zamenhof's father having been appointed inspector of private schools at Warsaw, the boy finished his education there, going on to Moscow University to study medicine. After qualifying in 1885 he returned to Warsaw, where he specialised as an ophthalmic surgeon. Warsaw, with its mixed population of Russians, Poles, Germans, and Jews, early directed Zamenhof's attention to the need for a common language as an instrument of better civic and racial understanding, his idea being well expressed in the verse of the Esperantist hymn "La Espero":—

Sur neŭtrala lingva fundamento
Komprenante unu la alian,
La popoloj faros in konsento
Unu grandan rondon familian.

Zamenhof drew attention to a preliminary form of Esperanto in 1878, but it was not till 1887 that he published his first text-book. Warsaw did not greet its local prophet with enthusiasm, and it was only after obstinate opposition that his propaganda spread through to Poland, Russia, Germany, Sweden, France, and finally in 1902, to England. In 1905 the first Esperanto Congress was held at Boulogne-sur-Mer and since then large gatherings have collected annually at Cambridge, Dresden, Barcelona, Washington, Antwerp, and Cracow, at which all the nations of the world have been represented. Medicine and pharmacy are now represented by the *Tutmonda Esperantista Kuracista Asocio* and the *Internacia Esperantista Farmaciista Asocio* respectively, and a medical periodical, *La Kuracisto*, only ceased to appear on the outbreak of war. Zamenhof therefore lived to see a large measure of recognition given to his ideal of the drawing together of the races by means of a language which could be commonly used in addition to their native tongues.

HYDROCARBONS IN FISH LIVER OIL.

THE discovery of a high proportion of hydrocarbon in fish liver oil is remarkable, and should set chemists and physiologists thinking as to how its presence is to be explained in place of the usual saponifiable fat or glyceride. Mr. A. Chaston Chapman reported at a recent meeting of the Society of Public Analysts that a sample of oil from certain species of sharks caught off the coast of Morocco had been found to contain as much as 90 per cent. of unsaponifiable matter, consisting almost entirely of a new unsaturated hydrocarbon to which the name of spinacene has been given and the formula $C_{30}H_{50}$ assigned. Apparently there are two main classes of shark-liver oils, the one having a specific gravity of about 0·86 and containing a very high percentage—up to 90 per cent.—of unsaponifiable matters, and the other having a specific gravity of 0·91 to 0·93 and consisting largely of glycerides with smaller proportions of unsaponifiable matters containing cholesterol. As Mr. Chapman points out, the fact that these two classes of oils have totally different chemical characters and could not therefore be used for the same purposes makes it desirable to qualify the simple designation "shark-liver oil" by a statement of analysis. In soapmaking, of course, an oil containing so much hydrocarbon would be practically useless. Should such oil find its way into cod-liver oil the therapeutic intentions of the prescriber may well be set at naught, hydrocarbons, as is well known, possessing no nutritive value.

THE next session of the General Medical Council will commence at 2 P.M. on Tuesday, May 22nd, when Sir Donald MacAlister, the President, will give an address.

Sir Ernest Goodhart and Mr. Gordon Goodhart have given the sum of £300 to Epsom College in memory of their father, Sir James Frederic Goodhart, who was one of the earliest pupils at the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A quarterly meeting of the Council was held on April 12th, Sir Watson Cheyne, the President, being in the chair. In accordance with the recommendation of the Jacksonian Committee the Jacksonian prize for the year 1916 was awarded to the author of the dissertation bearing the motto "Experientia docet"; when the envelope bearing this motto was opened, the President announced the name of Mr. Ernest W. Hey Groves. The subject of the dissertation was "Methods and Results of Transplantation of Bone in the Repair of Defects caused by Injury or Disease." It was resolved that the subject for the Jacksonian prize for the year 1918 should be "The Injuries and Diseases of the Pancreas and their Surgical Treatment." Sir Arthur Thomas Sloggett, K.C.B., C.M.G., was elected a Fellow of the College under the section of the charter relating to Members of 20 years' standing. Mr. Charters J. Symonds was appointed a representative of the College on the Senate of the University of London for a period of four years in the vacancy occasioned by the expiration of the period of office of Sir Rickman J. Godlee. The President reported that, together with the President of the Royal College of Physicians of London, he had received a deputation from the National Medical Union on the subject of the mobilisation of the medical profession.

TUBERCULOSIS IN AUSTRALIA.

THE report on tuberculosis which has just been issued by the committee appointed to consider and report on the causes of death and invalidity in the Commonwealth of Australia [1] is to be welcomed as a distinct contribution to the knowledge of the subject. The personnel of the committtee, over which Mr. James Matthews, an Australian Member of Parliament, presided, adds material weight to the character of their conclusions. Sir H. B. Allen's pathological and general knowledge is supplemented by Dr. J. H. L. Cumpston's special information, for he had previously acted as a Royal Commissioner when principal medical officer of Western Australia, and then made a most valuable report on the incidence of miner's phthisis. Dr. A. Jeffreys Wood, the fourth member of the committee, has particular experience of children, and thus rounds off the equipment of a well-chosen body.

Factors concerned in the Control of the Disease.

The report displays many points of especial interest in the light of the peculiarly favourable climatic conditions for chest diseases existing over the greater part of the Commonwealth, and the superior conditions of living among the general mass of people. The problem divides itself, there, as here, into two questions. To quote the report:—

> The whole study of tubercle must be of a twofold character—firstly in relation to exposure to infection with the bacillus, and secondly in relation to the resistance of the individual.

The second problem, which time is showing to be the more important of the two, has hardly received the consideration its importance deserves. The report states:—

> The two principal factors concerned in the determination of the results of infection are: (1) Personal resistance of the individual infected; and (2) effect of environment on the health of the person. With regard to the comparative importance of either of these two factors very little can be said in the present state of scientific knowledge, yet it is becoming increasingly evident that they are the main factors concerned in the cure and control of the disease.

The principal attention of the report is directed to the infectious side, although the evidence brought together does not suggest that the following up of that side so exclusively has yielded results commensurate with the expenditure.

In England and Wales, at any rate, the fall of the death-rate has not been materially altered by the knowledge that the disease was infectious, which was established in 1884 with Koch's discoveries, although in Australia there has been a more definite improvement since that discovery. This especially holds in Queensland, where the top year of a rising death-rate was 1884 with 196 per 100,000, as against 183 in England and Wales, whereas Queensland's death-rate in 1914 had fallen to 42, while England and Wales still stood at 101, more than double.

In this connexion it is interesting to contrast the position of the question in the old country, with its death-rate uniformly falling during the whole of the last century, with the various Australian States, which reached their top on a rising death-rate for pulmonary tuberculosis in the following years:—

New South Wales	(1885) 116	.....	(1914) 64
Victoria	(1887) 153	.....	,, 72
Queensland	(1884) 196	.....	,, 43
South Australia	(1888) 118	.....	,, 64
Tasmania	(1887) 115	.....	,, 45

In England the rate has uniformly fallen:—

In 1870 ... 241	In 1884 ... 183	In 1904 ... 124
,, 1874 ... 209	,, 1894 ... 138	,, 1914 ... 101

Making a comparison between the rate before 1884, we find Koch's discovery year and subsequent years:—

	1875	1885	1895	1914		1875	1885	1895	1914
England	220	177	139	101	Queensland ...	141	192	96	43
New South Wales	105	116	81	64	South Australia	100	99	96	64
Victoria	130	145	132	72	Tasmania	—	111	75	45

These figures suggest a somewhat generally held view among medical men in Australia that infection is possibly a matter of more importance in countries with higher average temperatures, which means that education concerning and precautions against infection are more valuable in countries belonging to the warmer latitudes.

[1] F. 11968. A. J. Mullett, Government Printer, State of Victoria.

Notification.—Death-rate in Relation to Age.—Distribution.

As regards notification, the question does not seem to be in a much more satisfactory condition in Australia than in this country, as the notification proportions to death-rate show that the average case is not notified till the later stage of the disease. In this connexion a great improvement will occur when the death-rate figures are published in definite periods, after notification has occurred, say, one month, six months, 12 months, 18 months, and so on, then a reasonable comparison of results can be instituted between the various States. It will probably be found that by far the greater number of deaths occur within six months of notification, suggesting that the present practice is to notify long after the infectious state has been reached, which in itself would more than nullify the procedure.

In relation to the age at which tubercle is most dangerous, a most interesting set of figures is given which demonstrates that the death-rate from tubercle does not in males differ very much in accordance with age, rising slowly from 111 per 100,000 between 25 and 29 till it reaches its maximum in males between 55 and 59, or 185 per 100,000, then slowly falling to 137 between 70 and 74. In women the incidence is quite different. The corresponding figures rapidly rise from 113 per 100,000 between the ages of 20 to 24, to a maximum of 135 per 100,000 between 25 and 29, and as rapidly fall to 121 between 30 and 34, gradually diminish to 91 per 100,000 between 60 and 69.

The rate is never so high for women as men after the thirtieth year. The high figures for women in early life are probably due to child-bearing and the sexual periods which have such an injurious relation to tuberculous women, and in this connexion it must be remembered that the healthy woman marrying the tuberculous man finds far greater danger of infection than if the risk were the other way about.

The distribution of tuberculosis in Australia is a matter that must attract considerable attention. The figures are for the year 1911 and for men only (the total number of deaths analysed being a little over 2000), but they yield first of all the statement that tubercle is most fatal among those of independent means, being at the rate of 222 per 100,000, independence being apparently even more fatal than mining and quarrying with its 200 per 100,000, industrial 153, professional and commercial 120, winding up with pastoral and other primary industries at 25 per 100,000. This suggests some reflections, and accords with the view held by many that resistance to tubercle is less among the well-to-do classes, and manifestly it can in their cases be neither housing nor want, but the disease catching them at their best, with no reserve, and with little grit, so to speak, putting the balance on the side of the bacillus. This return is very interesting from a treatment point of view, and suggests that the rich suffer from insufficient stamina, and that an increase of hardening should be aimed at for their successful treatment. The pastoral industry, on the other hand, probably working longer hours at a slower pace than any other, gives the best results.

Preventive Measures.

Years ago the prevalence of tubercle in the colony was supposed to be due to importation of cases attracted by the suitable climate, but statistics put an end to that fallacy, as it is found that 72 per cent. of the deaths occur amongst those born in the colony, and 13·5 with over 20 years residence, while only 6·2 occurred within five years of arriving. In a democratic community like Australia it is interesting to see that the treating of tuberculosis as a penal offence is suggested. That is all the more striking, as the view which regards infection as being the main cause of the death-rate has had little fresh evidence brought forward in its favour. Although gross infection undoubtedly does act injuriously, only in about 30 per cent. of the cases is any contact proved, which is an insufficient number to justify the drastic powers suggested. It must be remembered that Sir H. Allen's experience in the post-mortem room of the Melbourne Hospital confirmed the now generally admitted fact of the almost universal tuberculous infection in later life, as first practically demonstrated by Naegeli and von Pirquet. If this is so, the line of success must lie in seeking to increase the resistance rather than in the diminution of infection. It must be remembered that smaller incidence in women, especially at the later period when men are most subject, almost proves

this contention. The men and women graph at the end of the report is a most eloquent statement. The lowest women's death age is from 50 to 55, and the highest death age for a man is 55 to 59, women then being under 80 per 100,000 and men over 180 per 100,000, an impossible position if infection were the main cause of death-rate.

It should, we think, be remembered that penal clauses militate against their own success as tending to prevent the notification of earlier cases. The State should, in its own interest, be prepared to provide beds for all later cases desiring them. There should be no such position as "hospital beds full, no room for more." Likewise every effort should be made to remove notably infectious cases, on ordinary sanitary grounds, from lodging-houses and places of public resort. But interference with the home must be very carefully safeguarded except by the legitimate means of education and persuasion, save in those cases where poverty and dirt render some alteration necessary in the interests of the individuals themselves as well as the community.

Far more important in our view is the question of proper sustenance for the dependents of the tuberculous, a point at present more responsible for the extension of the disease than any other cause, by diminishing the resistance, from insufficient food, to those already probably considerably infected. Here comes in the question of the extreme value of the invalidity pension of the Commonwealth, which might well be copied in this country. It appears fair that the community should see that those to whom it supplies pensions should take proper precautions, and the pensions investigation suggested in the report has all in its favour. By investigating the condition of the pensioners many important problems could be settled to the material welfare of the community. How important these pensioners are to the Commonwealth finances is indicated by the payment made under the Act of £44,000 in the last five years. We are glad to see that the report suggests that the pensions should not be interfered with on the patients entering hospital.

Administrative measures, the report says, should be adapted to the knowledge and experience already available. The latter are, as we have seen, by no means the same in Australia as in this country, but there, as here, the keynote of success probably lies in the dispensary system, which keeps in touch with the tuberculous in their own homes. "Considerable extension," the report's recommendation runs, "of the dispensary system is required, with the object especially of detecting the early cases before they reach the stage when they are infectious for others. A necessary corollary to this is the provision of sufficient sanatorium and hospital accommodation to afford a bed for every early case." The object of this provision being contained in the statement, which we can cordially endorse: "They go to the sanatoria for cure and for education, and cure rests mainly upon education."

Another useful suggestion in the report is to the effect that the school medical inspectors be supplied with a definite standard of nutrition in school children for them to work upon. Undoubtedly the undersized and undeveloped are the most susceptible to tuberculous diseases in youth. We think it probable, however, that a different standard would be required for each colony and possibly for different degrees of latitude in each colony. The suggested observation of nutritional percentages[2] at regular periods by the teachers would probably bring early tubercle more under observation than any other single simple measure. The effect of different latitudes on the development of a similar race in regard to tuberculosis would, in addition, yield material of enormous importance to the problem of the white development in Australia, a matter more nearly touching national life in the Commonwealth than in any other part of the British dominions.

In conclusion, a word of commendation must be given for the excellent graphs which accompany the report, the high character and able presentment of which reflect the careful selection of the Commissioners.

[2] THE LANCET, 1915, i., 85.

THE LATE CHARLES MOON, M.D. EDIN.—Dr. Charles Moon, whose death has just occurred at his residence, Dundee, was born in 1843, and educated at St. Andrews and Edinburgh Universities. After qualifying, he started practice in Dundee, where he built up a large practice over a period of half a century. He is survived by a widow, five sons, and two daughters.

THE CONTROL OF VENEREAL DISEASES.

The Bootle Scheme.

THE scheme for the diagnosis and treatment of venereal diseases adopted by the Bootle town council has been approved by the Local Government Board and is now, we learn from Dr. W. Allen Daley, medical officer of health, in operation. The salient features of this scheme are as follows:—

1. Cases of venereal disease in their earlier and all communicable stages will be dealt with at the treatment centre (borough hospital), irrespective of their place of residence or their means. 2. Mr. W. N. Clemmey, M.R.C.S., honorary surgeon and radiologist to the hospital, has been appointed medical officer to the clinic, to be held at noon on two days a week, with facilities for attendance in the evening of persons unable to attend during working hours. 3. Provision has been made at the hospital for microscopical examination of specimens from gonorrhœal cases. Examination for spirochætes and Wassermann reactions will be undertaken by Professor L. M. Beattie at the University of Liverpool. 4. Private practitioners may send patients to the hospital for blood to be taken for Wassermann reactions or for smears for the examination of spirochætes to be prepared. 5. A report is posted to any private practitioner who sends a case for consultation. 6. The Borough Hospital Committee receives £100 per annum for the services of its medical officer, and £25 for therapeutic agents for a period of six months. Approved substitutes for salvarsan to be supplied by the Corporation. The Hospital Committee reserves two beds to be used exclusively for persons suffering from venereal diseases, the council paying £200 per annum, and an additional sum of 5*s.* per night is paid for each person admitted for intravenous injection when the two reserved beds are already occupied. 7. On personal request from private practitioners, reports on the previous treatment of patients will be furnished, but such reports will be given only with the consent of the patients. 8. The scheme does not include the treatment of patients in places other than the hospital. If the medical officer is called upon to attend patients in their homes a special fee will be charged.

The cost of these arrangements for the first 12 months is estimated at £400, including the provision of a third bed in the hospital on 200 nights. The medical officer of health is a member of the Liverpool Branch of the National Society for Combating Venereal Diseases and under its auspices lectures are being given for public instruction and enlightenment.

Antimonial Treatment of Phagedæna and Syphilis.

A paper by Dr. D. José Brotons, in the *Revista de Medicina*, on the treatment of phagedæna and syphilis by the intravenous injection of antimonial compounds (Los compuestos antimoniales por via endovenosa en el tratamiento del fagedenismo chancroso y en la sifilis) is of considerable interest. The author gives clinical histories of five cases treated by this method, three of soft chancres with phagedæna, one of ulcerating gummata, and one of hard chancre with very severe secondary symptoms and rapidly deepening cachexia. In all these cases rapid improvement leading to cure of the condition was brought about by intravenous injections of doses of tartar emetic varying from 3 to 10 centigrammes, and this after other methods of treatment had failed to arrest the morbid process. Dr. Brotons claims for antimony specific "anti-spirillary" properties, and dissents from McDonagh's view that it acts merely by heightening the effect of iodine.

Post-Graduate Summer Courses in London.

Three hundred panel practitioners have already attended the courses of instruction given by Lieutenant-Colonel L. W. Harrison at the Military Hospital, Rochester-row, London, S.W. 1, and arrangements are being made for holding further courses of instruction at the hospital during the forthcoming summer. Many practitioners were compelled to forgo attendance at the winter courses through pressure of work. The summer courses will be extended over a period of six weeks in order to give more opportunities for practical work. Lieutenant-Colonel Harrison is prepared to give those practitioners who have already attended at the hospital a larger opportunity of attending practical demonstrations. Applications should be made to the secretary of the London Panel Committee, 51, Chancery-lane, W.C. 2.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Results of Operation in Purulent Arthritis.

M. Auvray has recently summarised at the Society of Surgery the operations performed by him during the war in 111 cases of suppurative arthritis of the large joints. In every case definite purulent arthritis was shown to be present, sometimes unrecognised for several weeks after the infliction of the wound. Only the immediate results of operation were available in regard to life and the preservation of the limb, the majority of patients having been lost sight of after healing of the wound. The joints affected were the knee (34), the elbow (32), the shoulder (20), the ankle (12), the wrist (7), the hip (4), and the sacro-iliac articulation (2). Eight patients died, a total mortality of 7 per cent. Of the cases of purulent arthritis of the wrist, 7 were resected and all recovered. Of the elbow, 5 underwent arthrotomy only and all recovered; 9 in addition underwent secondary resection, and all of these also recovered; among the 18 cases in whom a more or less typical resection of the joint was of necessity performed at the onset, one death occurred. Of 20 cases of suppurative arthritis of the shoulder 2 were treated at the onset by resection and recovered; 18, of whom 1 died, underwent secondary resection. For purulent arthritis of the ankle 12 operations were performed, of which 2 were amputations; all recovered with the exception of one of the amputation cases. Of the 34 cases of suppurative arthritis of the knee 21 were submitted to arthrotomy, resulting in 20 recoveries and 1 death; 4 were treated by resection, of whom 1 died and another, owing to symptoms of infection, was obliged to undergo amputation; in 9 other cases recourse to amputation proved necessary. Out of a total, therefore, of 10 amputations there were 7 recoveries and 3 deaths. Finally, in cases of suppurative arthritis of the hip, 4 resections gave 4 recoveries.

Diphtheria in the Army.

In a study dealing with the work of a diphtheria service Dr. Louis Rue calls attention to the necessity of employing large doses of serum, especially under certain conditions. This, although a cardinal point in treatment, is insufficiently recognised by some practitioners. Under pre-war conditions an average dose of 120 to 150 c.c. of serum in each case had reduced the total mortality to 3·45 per cent., and only a very small number of cases of diphtheritic paralysis were seen. Dr. Orticoni, who is an advocate of large doses of serum, found on his arrival at an infectious hospital base 20–25 and even 29 per cent. mortality from certain sections of the front where doses of 50–60 c.c. daily were employed; while numerous cases of generalised paralysis resulted during convalescence. Orticoni systematically introduced the method of large and repeated doses. In cases of average severity he injected some 300 to 500 c.c. in the course of the disease; in severe cases 700 to 1000 and even 1800 c.c., commencing with doses of 100 to 120 c.c. daily in two injections. During a period of seven months he treated thus 208 cases of diphtheria, with only a single death. Albuminuria became infrequent, and only two or three patients passed at any time as much as 0·1–0 3 per cent. of albumin. Albuminuria is no contra-indication to serum treatment; on the contrary, if applied in the course of a case of moderately acute diphtheritic albuminuria the albumin rapidly disappears. The only troublesome complications due to the serum were articular. Urticaria was frequent, affecting the abdominal walls, or more generalised, and attended with itching. Paralysis was rare. The serum should be continued two or three days after the false membrane has disappeared. Larger doses were employed when the false membrane was greyish in colour or diffluent, or when the surrounding mucosa was much affected. Bleeding from the mouth or nose, or blood-staining of the mucosa around the false membrane suggest the advisability of large doses, especially as the serum is not a negligible factor in increasing the coagulability of the blood. The fear of anaphylaxis was found to be quite illusory, as it could be avoided by a preventive administration of a dose of 1 to 4 grammes a day of calcium chloride and of injections of 1/4 of a milligramme of adrenalin. M. Rue indicates a symptom which might be disturbing to a doctor who had not been warned. In certain cases a localised arthralgia occurs in the temporo-maxillary articulations, occasionally affecting the cervical and dorsal spine. The resulting trismus and rigidity of the spine then suggest tetanus. The fact of a previous injection of serum and the frequent co-existence of urticaria lead to a correct diagnosis.

"Jigsaw" Autoplasty.

M. Morestin recently made a communication to the Academy of Medicine on a form of autoplasty which does not require any addition of foreign tissue. At most it is necessary to take smallish strips from the immediate neighbourhood of the injury, for whereas deformity is often considerable the actual loss of substance may be very slight or even nil. The tissue debris, scattered in irregular rents, shrivelled, or rolled up, are still generally living. To turn these fragments to good account it is necessary to begin with the methodical removal of cicatrices, scrupulously respecting all that remains of the healthy soft tissues. Strips of mucosa are isolated without paying much attention at first to their method of disposal. Dissection must be patient and complete, and the greatest possible mobility of the wound secured by dividing all adhesions. At this stage the question arises of bringing together and reuniting the fragments. Little by little the best arrangement is found, the operator being guided all the time by the facts he ascertains. In this form of reparative surgery no two cases are identical. Sometimes the results obtained may be improved by touching up later, but in many cases they are perfect from the first. Jigsaw autoplasty has extensive indications in all injuries of the face, especially in mutilations of the lips and the cheeks. General anæsthesia is hardly ever necessary.

April 16th.

URBAN VITAL STATISTICS.

(Week ended April 7th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 17·3, against 16·9 and 18·0 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 16·9, or 1·2 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 7·0 in Cambridge, 7·7 in Oxford, and 7·8 in Hornsey, to 28·0 in Middlesbrough, 28·5 in Great Yarmouth, and 29·8 in Warrington. The principal epidemic diseases caused 438 deaths, which corresponded to an annual rate of 1·3 per 1000, and included 279 from measles, 56 each from whooping-cough and infantile diarrhœa, 36 from diphtheria, 8 from scarlet fever, and 3 from enteric fever. The deaths from measles showed a further increase compared with the numbers recorded in the 10 preceding weeks, and caused the highest annual rates of 3·4 in Bolton, 3·6 in Middlesbrough and in Sunderland, and 6·3 in Dudley. The 755 cases of scarlet fever and the 1297 cases of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 40 and 80 below the numbers remaining at the end of the previous week. Of the 5627 deaths from all causes in the 96 towns, 191 resulted from violence. The causes of 64 of the total deaths were uncertified, of which 16 were registered in Birmingham, 5 in Liverpool, and 4 in Gateshead, but only 1 in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the death-rate was equal to 16·9, against 16·2 and 17·9 per 1000 in the two preceding weeks. The 386 deaths in Glasgow corresponded to an annual rate of 18·0 per 1000, and included 34 from whooping-cough, 23 from measles, 6 from infantile diarrhœa, 3 from diphtheria, and 1 from scarlet fever. The 121 deaths in Edinburgh were equal to a rate of 19·0 per 1000, and included 10 from measles, 8 from whooping-cough, and 1 each from diphtheria and infantile diarrhœa.

Irish Towns.—The 198 deaths registered in Dublin were equal to an annual rate of 25·9, or 3·4 per 1000 above that recorded in the previous week, and included 20 from measles, 3 each from whooping-cough and infantile diarrhœa, and 1 from diphtheria. The 190 deaths in Belfast corresponded to a rate of 25·2 per 1000, and included 8 from measles, 5 from infantile diarrhœa, 2 from enteric fever, and 1 from whooping-cough.

BLINDED SAILORS AND SOLDIERS IN EDINBURGH.—On April 12th Mr. Barnes, the Minister of Labour, visited the Scottish Blinded Soldiers' and Sailors' Hostel at Newington House, Edinburgh. The history and work of the hostel were explained to him by Dr. Burns and Mr. Sommerville Grieve, Mr. W. M. Stone, the superintendent, urging the disadvantage of centralising in London the training of blinded service men. After inspecting the hostel and workshops, Mr. Barnes said that the work at Newington House ought to have a part in any general scheme of organisation for blinded service men.

Correspondence.

"Audi alteram partem."

RADIATION IN MALIGNANT DISEASE.

To the Editor of THE LANCET.

SIR,—I have read with much interest the paper on this subject by Captain A. A. Russell Green and the leading article in your issue of April 7th. While in no sense wishing to decry the effect of radiation, I cannot help thinking that you and your correspondent have formed a far too sanguine opinion on insufficient data. I select for comment the treatment of rodent ulcer, a subject to which I have devoted long study, and which, in fact, forms the chief basis of your correspondent's paper, for he tells us that only two out of the 53 cases of "neoplasmata," on which he reports, were not rodent. Your correspondent bases his statistics, as far as I can follow them, on the mere healing of the rodent lesion, which I submit with confidence is a fallacious test. Thus in Table IV. we are told that 66 per cent. of the traced cases were "healed," but the detailed analysis in which the duration of the observation is mentioned, in 24 cases which remained healed, more than half of these (13 to be exact) had been under scrutiny for less than two years. Moreover, analysing the 25 cases of rodent ulcer in Table I., the most important from the author's standpoint, for these constitute the "traced healed cases," we find that only seven of the 25 cases had a longer duration than five years, a reasonable conclusion from which data is that these were comparatively early and small lesions, peculiarly amenable to treatment of any kind. And this conclusion receives some confirmation from a consideration of Table II., "traced unhealed cases," for of 14 such, seven were of longer duration than five years, and in three of the remaining seven the duration is not specified. The author therefore in his successful cases is probably dealing with small rodents as a rule.

Now if we make mere healing of the lesion the criterion of success it is obvious that no treatment can compare with excision, for here "healing" is practically immediate and complete. But tested by the sole criterion which is of real importance, the ratio of recurrence, the argument for excision is greatly weakened, for an examination of published statistics of the results of operation makes on the whole melancholy reading. Two years ago in a paper on Rodent Ulcer contributed by me to the *British Journal of Dermatology*, reference was made to a table published by Butlin, in which, of a large series of operated cases kept under observation for three years, recurrence took place in 63 per cent. And I believe that that period of observation, although it compares very favourably with your correspondent's data, is far too short to allow of a considered judgment as to ultimate values of competing treatments.

My personal opinion, expressed in the paper to which I have referred, is that a method of far wider application (for it is at the disposal of every practitioner, which is certainly not the case with radium) is the method of freezing with carbon-dioxide snow, a peculiarly valuable method in the small early rodent, and if practised at its first stages would, I am confident, materially lessen the toll of "unhealed" and inoperable cases.—I am, Sir, yours faithfully,

Wimpole-street, W., April 17th, 1917. E. GRAHAM LITTLE.

To the Editor of THE LANCET.

SIR,—In a leading article in THE LANCET of April 7th you advocate post-operative radiation in cancer. You say: "However favourable a case may appear, no surgeon can be sure that he has removed every trace of malignancy; or, indeed, that he himself has not scattered malignant cells *over the field of operation*" (italics mine). If this was the worst that could happen, immediate post-operative radiation might suffice to deal with it. But who shall say to what part of the body these cells may not be carried in the blood-stream? I have for years been advocating *pre*-operative, as well as *post*-operative, radiation, and perhaps you will allow me to quote from a contribution which I made to a discussion on "Radiation in Cancer," which was opened by Sir Alfred Pearce Gould at the annual meeting of the British Medical Association at Brighton in July, 1913. Having pointed out that with modern X ray technique a depressant effect can be produced upon cancer cells long before there is any injury to the skin, I said:—

> We know that whenever and wherever the knife is employed there is always a risk of disseminating malignant cells, which subsequently take root and flourish. It is not to be supposed, however, that this colonisation is allowed to take place without opposition on the part of the invaded tissues. Many of the would-be settlers are no doubt slain before they are able to propagate their kind. Some, nevertheless, usually escape, but if these specially vigorous cells were subjected to previous radio-therapeutic attack, their chances of post-operative survival would be materially lessened. A cancerous tumour in an early stage presents an opportunity for X ray therapy which is never repeated. The enemy is concentrated in close order, and can be assaulted in force. Every cancer cell which escapes removal will then be in a devitalised condition, and in the presence of tissues whose resisting power has been artificially heightened.

It has long been known that cancer grafts exposed to X rays will rarely "take." The present writer has in his possession pathological reports of cases of breast cancer which had been rayed for 3–4 weeks previous to operation. These reports stated that most of the cancer cells showed degenerative changes. Moreover, American workers have recently proved that *raying of the wound surface into which a graft is to be put* reduces by one-half the percentage of successful plantings.[1] This furnishes experimental proof of another principle for which the present writer has contended—viz., that the effect of X rays in stimulating the healthy tissues to resistance is quite as important as any directly depressant action upon the cancer cells. Disregard of this principle leads to dire results, as is sometimes seen in the extensive sloughing of normal tissues around a buried tube of radium.

You rightly deprecate any attempt to pit X rays against radium or *vice-versa*. May I point out, however, that any comparisons between X ray and radium effects are valueless unless exact details as to filtration, quality of ray, milliampèrage in tube, distance from skin, time, number and spacing of exposures are all given. For example, a "reaction" produced by soft unfiltered X rays has a significance quite other than a similar response produced by a very penetrating, heavily filtered Röntgen radiation. In the one case the reaction is rapidly provoked and involves surface cells only; any malignant tissue lying even a few millimetres below the surface is unaffected. In the other, response is more tardy, but the disturbance reaches to a depth of some centimetres. The bearing of these facts upon liability to recurrence is self-evident.

I am, Sir, yours faithfully,

FRANCIS HERNAMAN-JOHNSON.

Cavendish-square, W., April 8th, 1917.

*** Mr. Hernaman-Johnson states well-known views.—ED. L.

THE TECHNIQUE OF LUMBAR PUNCTURE.

To the Editor of THE LANCET.

SIR,—I have noticed twice lately, while performing lumbar puncture for cerebro-spinal fever, a phenomenon which might, if unrecognised, cause an error in diagnosis:—

1. In the first case the needle (Barker's) was inserted into the theca, and on withdrawing the trocar cerebro-spinal fluid came out at the normal rate—i.e., a drop every two or three seconds. The needle was then pushed in a little further and the fluid came out in a jet under considerable pressure. This occurred again in the same patient during a subsequent puncture.
2. In this case the fluid came out at the normal rate, but inserting the needle farther did not increase the rate of flow. As there were good grounds for suspecting cerebro-spinal fever, it was pushed on until felt to impinge on the body of the vertebra, with still no alteration in the rate of flow, even though the trocar had been reinserted. It was then withdrawn a little and the fluid came off in a jet under pressure.

In both cases puncture was performed under a general anæsthetic (C.E.).

If no fluid were obtained at all one would, of course, know the needle was blocked or that the theca had been missed, but when, on withdrawal of the trocar, the fluid is found to flow at a normal rate, a mistake in diagnosis might easily occur, especially as in early cases the fluid is often not even opalescent and contains few or no organisms.

1 See "The Cancer Problem and the World War," Pract., March, 1917, p. 230.

As I have seen no mention of this in the literature, but have had two cases showing it within the last month, I thought that—though a small point—it might be worth mentioning to you.—I am, Sir, yours faithfully,

F. A. WILLIAMSON,
April 8th, 1917. Temporary Surgeon, R.N.

*** The difficulty is a real one, and deserves more consideration than it has yet received."—ED. L.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

To be temporary Surgeons: W. T. Beswick, E. D. Brosker, J. A. Hadfield, and R. McM. Bowman.

ARMY MEDICAL SERVICE.

Col. J. H. Daly is retained on the Active List under the provisions of Articles 120 and 522 Royal Warrant for Pay and Promotion, 1914, and to be supernumerary.

ROYAL ARMY MEDICAL CORPS.

To be temporary Majors: Temp. Capt. B. H. Slater, A. G. Phear, and R. O. Moon.

a B. Crothers to be temporary Honorary Major whilst employed with No. 22 General Hospital.

The relinquishment of his temporary commission as Captain by Temp. Capt. R. A. Rankin, Canadian A.M.C., is cancelled.

Temporary Lieutenants to be temporary Captains: H. H. Hannigan, J. F. Gill, F. J. Strachan, F. B. Young, A. M. Masters, C. E. Molino, R. B. Radie, J. W. Potter, R. H. Bridge, G. C. Berg, E. L. Hopkins, L. M. Mayers, G. W. Young, T. P. Buist, C. E. G. Bateman, A. E. Foerster, W. G. Weston, G. B. Mason, W. H. Thomas, J. Hewat, E. A. Morgan, C. W. Walker, R. H. L. O'Callaghan, H. S. Gaskell, G. F. Forde, W. J. McIvor, R. J. P. Waugh, B. P. Allinson, T. W. Mason, G. J. Knaggs, R. W. Chapman, A. Walker, W. J. Evans, J. N. Deacon, F. A. O'Donnell, A. Pimm, P. Figdor, W. A. Curry, D. S. Taylor, W. J. Tulloch, C. Cairnie, W. K. Bell, D. L. MacKenna, G. F. Nelson, C. V. Kebbell, D. Rees, J. A. O'Dea, E. E. Chipp, G. C. W. Williams, C. A. R. Nitch, P. J. S. O'Grady, C. Weller.

C. R. Stewart to be temporary Hon. Captain, without pay or allowances, and S. E. T. Shann to be Hon. Captain while employed with No. 5 British Red Cross Hospital.

To be temporary Lieutenants: L. J. Hood, H. S. Thomas, G. F. Fismer, C. T. Galbraith, E. H. R. Altounyan, A. C. Meek, H. A. Lane, W. H. Johnston, A. N. Collier, G. H. F. Graves, G. M. Simpson, C. H. Booth, J. T. Brown, R. J. Duthie, A. W. Gill, J. H. Hall, J. A. Bateman, C. O. Bowman, A. Shelley, J. McCartney, M. B. Taylor, D. L. Davies, F. D. Simpson, L. du Vergé, L. D. H. Baugh, P. C. Bushnell, C. F. Hardie, H. B. Pare, H. G. White, L. A. H. Bulkeley, J. Gaff, E. D. Keane, H. S. A. Hogg, G. R. Dobrashian, Lieut. R. G. Hill, from 2nd East Anglian Brigade, R.F.A., T.F.; J. A. A. Boddy, F. C. H. Bennett, S. B. Couper, R. W. Pearson, J. E. English, A. C. Hallowes, A. H. Clough, H. G. Steel, J. P. McVey, W. B. Jack, R. J. Helsby.

To be temporary Honorary Lieutenants, without pay or allowances: E. K. Clarke, F. F. Tisdall.

Officers relinquishing their commissions: Temp. Capt. J. A. Mescall (on account of ill-health), Temp. Capt. R. M. Clarke, Temp. Capts. F. W. H. Hutchinson, J. P. Walker, A. H. Conder, A. Wiley, F. H. Rudge, N. G. Horner, R. Fielding-Ould, C. S. Pantin, A. C. Freeth, S. J. Henry, J. W. Wood, G. M. de Vine, W. C. McN. Dickey (on account of ill-health), F. D. Atkins (on account of ill-health); Temp. Hon. Capt. J. F. Mackay and Temp. Hon. Lieut. Richard S. Topham (having resigned their appointments under the British Red Cross Hospital, Netley); Temp. Lieuts. H. W. Paddell, J. Dunlop, C. L. Forde, J. K. Bell, S. A. McClintock, R. B. Gorst, J. L. Power, R. V. Murphy, C. Costello.

SPECIAL RESERVE OF OFFICERS.

Capt. P. S. Vickerman to be temporary Lieutenant-Colonel while holding a special appointment.

Lieutenants to be Captains: J. M. Courtney, G. R. Barry, M. McGillivray, T. D. Renwick.

Capt. J. H. Bayley to be Acting Lieutenant-Colonel which commanding a Field Ambulance.

Lieutenant on probation G. R. Waller relinquishes his commission.

TERRITORIAL FORCE.

Capt. (acting Lieut.-Col.) T. H. Chittenden reverts to the acting rank of Major on alteration in posting.

Capt. (temp. Major) W. D. Sturrock to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. E. G. Annis to be acting Major whilst in command of a Field Ambulance.

Capt. O. L. Appleton to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. G. C. E. Simpson to be acting Lieutenant-Colonel whilst commanding a Casualty Clearing Station.

Lieut. J. Steele to be Captain and to remain seconded.

Lieut. J. S. Ranson to be Captain.

Major (temp. Lieut.-Col.) L. P. Demetriadi relinquishes his temporary rank on ceasing to command a Casualty Clearing Station.

Capt. G. J. M. Martin relinquishes his commission on account of ill-health.

DEATHS IN THE SERVICES.

Surg.-Gen. Sir William Taylor, K.C.B., late Director-General of the Army Medical Service, on April 10th, aged 74, at Windsor. He joined the Army Medical Staff in 1864, and served in Canada and in India, where, through the Burma campaign, he was on the Staff of the Commander-in-Chief (mentioned in despatches). During the Chino-Japanese War he acted as Military-Medical Attaché to the Japanese Army. In the Ashanti Expedition, 1895–96, he was principal medical officer (promoted to the rank of surgeon-general). He was also principal medical officer of the expedition to Khartum in 1898, and was present at the Battle of Omdurman. From 1898 to 1901 he was principal medical officer in India, and afterwards Director-General of the Army Medical Service, which post he held from 1901 to 1904. He was created C.B. in 1898 and K.C.B. in 1902. He was a Knight of Grace of the Order of St. John of Jerusalem in England, and an honorary LL.D. of Glasgow University.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Capt. G. B. Bailey, Australian A.M.C.

Previously reported Missing, now reported Killed.

Capt. S. J. Linzell, M.C., R.A.M.C., qualified at Edinburgh in 1912, and held the appointment of house physician at the Royal Infirmary in that city, and was also an ex-President of the Royal Medical Society of Edinburgh. He obtained his captaincy in the R.A.M.C. in March, 1915, and was on the staff as a Deputy Assistant Director of Medical Services. The award of the Military Cross is announced in our "Honours List."

Died.

Capt. H. A. Lunn, R.A.M.C., qualified at Glasgow in 1902, and practised in India before the war. He joined the R.A.M.C. in 1914 and served in Gallipoli and elsewhere. He returned to India at the close of last year, and died in hospital there of fracture of the skull brought about by an accidental fall.

Capt. J. McC. Orme, R.A.M.C., qualified at Edinburgh in 1915, and thereupon joined up.

Missing, believed Drowned (in the Hospital Ship "Salta" mined in the Channel).

Capt. J. R. Gyllencreutz, R.A.M.C., was a student at St. Thomas's Hospital, London, and qualified in 1908. He held appointments at Wandsworth Infirmary, at Brentford Infirmary, and at the Royal Hospital, Portsmouth, and was in practice at Richmond, Surrey, prior to joining the R.A.M.C.

Capt. G. C. B. Hawes, R.A.M.C., was a student at St. George's Hospital, London, and qualified in 1893. He held house appointments at St. George's, and was in practice at Pangbourne, Berks (for which county he was a J.P.), before joining the R.A.M.C.

Capt. T. G. S. Hodson, R.A.M.C., was educated at Newcastle-on-Tyne and at the London Hospital, and qualified in 1893. He was in practice in Wimpole-street, London, at the time he joined the R.A.M.C.

Lieut. J. Naylor, R.A.M.C., was a student at St. Bartholomew's Hospital, London, and qualified in 1889. He held a surgical appointment at the Derbyshire General Infirmary, and was in practice at Tipton Green, Staffs, prior to joining the R.A.M.C. in October last.

Capt. H. G. Smith, R.A.M.C., was a student at St. Bartholomew's Hospital, London, and qualified in 1909. He held appointments at the Westminster Hospital and at the London Temperance Hospital, and for a time was resident surgeon at the Lord Derby War Hospital. He was assistant medical officer of health and assistant school medical officer to the borough of Croydon, where he joined the R.A.M.C. in July last year.

Wounded.

Capt. W. L. Cassells, R.A.M.C.

Capt. W. M. Penny, R.A.M.C., attached Yorkshire Light Infantry.

Capt. W. N. Gilmour, M.C., R.A.M.C., attached Royal Scots.

Capt. J. R. Kemp, M.C., R.A.M.C., attached Essex Regt.

THE HONOURS LIST.

The following awards to medical officers are announced:—

Distinguished Service Order.

Temp. Lieut. John Maximilian Hammond, R.A.M.C., attached Devonshire Regiment.

For conspicuous gallantry and devotion to duty in evacuating a large number of wounded under the most difficult conditions. He was himself subsequently wounded, and though both his feet were practically blown off he ordered his stretcher-bearers to carry away another wounded man first.

Bar to the Military Cross.

Temp. Capt. Ernest Emrys Isaac, M.C., R.A.M.C., attached Royal Fusiliers.

For conspicuous gallantry and devotion to duty. He worked continuously under very heavy fire and was responsible for the successful evacuation of the wounded. He set a splendid example of courage and determination throughout the operations.

(The award of the Military Cross was announced in THE LANCET of Oct. 28th, 1916, p. 770.)

Temp. Capt. Patrick Joseph Lane, M.C., R.A.M.C.

For conspicuous gallantry and devotion to duty. On several occasions he led out squads of stretcher-bearers under very heavy fire and succeeded in bringing in many wounded men. He set a splendid example of courage and determination throughout.

(The award of the Military Cross was announced in THE LANCET of Dec. 2nd, 1916, p. 958.)

Capt. Rudolph Albert Peters, M.C., R.A.M.C., attached King's Royal Rifle Corps.

For conspicuous gallantry and devotion to duty. He continually tended the wounded under very heavy fire. He set a splendid example and showed an absolute disregard for his own personal safety. He has on many previous occasions done fine work.

(The award of the Military Cross was announced in THE LANCET of Oct. 28th, 1916, p. 770.)

Temp. Capt. John Caruthers Sale, M.C., R.A.M.C., attached Royal Fusiliers.

For conspicuous gallantry and devotion to duty. He displayed great courage in collecting and dressing the wounded in the face of a very heavy hostile barrage. He set a splendid example to all ranks.

(The award of the Military Cross was announced in THE LANCET of Dec. 2nd, 1916, p. 959.)

Military Cross.

Temp. Capt. Victor Thomas William Eagles, R.A.M.C.

For conspicuous gallantry and devotion to duty. He organised and led search parties for wounded, and worked continuously under very heavy fire for over 24 hours. He set a splendid example of courage and determination throughout.

Capt. Norman Parsons Jewell, East African Medical Service.

For conspicuous gallantry and devotion to duty. He worked continuously for 62 hours, and, single-handed, attended to over 100 wounded men. He has on many previous occasions done fine work.

Temp. Lieut. Charles Gordon Kemp, R.A.M.C., attached Northern Regiment.

For conspicuous gallantry and devotion to duty. He worked unceasingly for two days under very heavy fire, and succeeded in evacuating a large number of wounded. He displayed great courage and determination throughout the operations.

Capt. Stanley James Linzell, R.A.M.C.

For conspicuous gallantry and devotion to duty in superintending the evacuation of the wounded. He continually visited the forward Battalion Headquarters, passing under very heavy fire. He set a splendid example of courage and determination throughout. (The death of this gallant officer is chronicled above.)

Temp. Capt. Thomas McCosh, R.A.M.C., attached Welsh Regiment.

For conspicuous gallantry when his aid post was subjected to heavy shell-fire for over three hours. He, with absolute disregard for his own personal safety, set a splendid example of courage and devotion to duty.

Temp. Surg. William James McCracken, R.N.

For conspicuous gallantry and devotion to duty. He continually attended to the wounded under very heavy fire. He has previously done fine work.

Temp. Capt. Herbert Walker, R.A.M.C.

For conspicuous gallantry and devotion to duty. He led his stretcher-bearers with great courage and determination for a period of 36 hours. It was due to his energy and resource that a large number of wounded were evacuated under the most trying conditions.

Capt. Gladston Montague Hunt, Australian A.M.C.

For conspicuous gallantry and devotion to duty. He showed an absolute disregard of danger and set a splendid example to his stretcher-bearers, working with them over ground continually swept by heavy fire. He worked for six consecutive weeks in a forward area in charge of an advanced dressing-station.

Capt. Harrie Bertie Lee, Australian A.M.C.

For conspicuous gallantry and devotion to duty in evacuating the wounded. He set a splendid example throughout and worked continually under very heavy fire. He has previously done fine work.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Capt. V. O. Todd, Royal Lancaster Regiment, second son of Colonel O. Todd, A.M.S.

Brevet-Major H. E. Trevor, Northamptonshire Regiment, temporary Lieutenant-Colonel Essex Regiment, son of Surg.-Gen. Sir F. Trevor, K.C.S.I., C.B., of Steeple Aston.

Second Lieut. A. P. Webb, King's Shropshire Light Infantry, second son of Dr. H. P. Webb.

Second Lieut. G. S. Spence, South Wales Borderers, younger son of the late Dr. W. J. Spence, of Bedford.

Second Lieut. D. N. O'H. Humphry-Davy, Hampshire Regiment, younger son of Dr. A. Humphry-Davy, of Bournemouth.

MEDICAL MOBILISATION IN AMERICA.

The important part which medicine has taken in the war has been generally acknowledged and appreciated. When war was declared few people realised that it would develop on such a huge scale, or that the mobilisation of so large a proportion of the medical profession in the British Isles would be needed to supply the demands of the Army; yet in spite of these, the organisation of the medical profession has produced results which, when the true medical history of the war comes to be written, will redound to its credit. Coming into the war late America will have before her the vast medical experience of our own and other countries as well as her own gained in the prosecution of her beneficent Red Cross and other medical work on behalf of all the belligerents; but that she will also have to attend to her own domestic problems and that she has resolved firmly to do so is shown in a stirring leading article which appeared before the actual declaration of war with Germany. In the February issue of *American Medicine* the writer says: "Lethargy, indifference, inaction have given way to enthusiasm, application, and devoted service. A nation of many component national factors has suddenly been welded into a homogeneous mass." In words which might equally apply to our own country, America's failure to realise her responsibilities as a Christian nation is pithily summed up thus: "In the midst of prosperity and material success, the nation has grown careless, indolent, and wasteful. National adolescence has been characterised by bombast, temerity, and extravagance." While recognising the need for the careful guidance of public opinion without jingoistic utterances and for patriotic inspiration free from cries for blood, it is pointed out that "If there must be war, let it be approached with grimness and determination as an unpleasant duty to be performed, marshalling the best brains and brawn of the nation for the performance of the various duties for the successful determination of an early and permanent peace." The duties of the medical profession being protective and restorative and its services valuable to friend and foe alike, its thorough organisation is demanded and the article continues, "On the brink of conflict, it is time to pause and contemplate the constructive possibilities for true patriots. How can the medical profession best serve the nation? There should be not merely the development of new organisations requiring new machinery, large funds and scattered centres of interest, but the physicians of the nation, as a whole, should be organised as far as possible through the normal agencies now existent." From all this it seems clear that America, who remained neutral while she could do so without dishonour, has resolved now to enter the quarrel in a spirit of determination which should help to bring about the peace for which the whole civilized world is praying.

THE WAR AND HOSPITAL SHIPS.

Our columns this week contain two reminders of the merciless nature of the present naval warfare and the dangers to which the officers and men of the Royal Army Medical Corps are exposed on hospital ships. When the *Salta* struck a mine in the Channel during bad weather on April 10th five medical men holding commissions, as well as nine nursing sisters and 38 orderlies, are presumed to have been drowned. Lieutenant-Colonel A. G. P. Gipps's interesting surgical experiences on the *Asturias* remind us that that ill-fated vessel, after successfully evading attack by a submarine in February, 1915, was torpedoed on the night of March 20th–21st last, when the casualties among the medical services on board included 11 dead, 3 missing (a female staff-nurse among them), and 17 injured. Ten days later the *Gloucester Castle* was torpedoed, all the wounded on board being saved. A new element has thus been introduced into the terrors of warfare and even the wounded man is no longer immune from further injury.

Various Experiences in a Hospital Ship.

The following experiences in a hospital ship, entitled "Notes from H.M.H.S. *Asturias*," are recorded by Temporary Lieutenant-Colonel A. G. P. Gipps, R.A.M.C. (T.C.):—

This ship has been employed as a hospital ship by the War Office since the middle of August, 1914, of which time I have been in command some 17 months. Some 350 to 400 operations have been performed on board, entirely by the staff of the Royal Army Medical Corps, which consisted of six medical officers besides myself.

On one voyage some 40 cases of gas gangrene occurred, all in patients taken off Gallipoli during the fighting. The gangrene spread so rapidly as to be almost visible in its advance, especially in the trunk. None of the various treatments at all seemed to modify the attacks. Some lives were

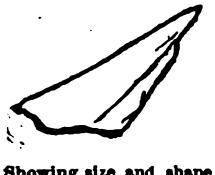
seemingly saved by amputation high up where the extremities were attacked, even when tissues cut through at the time of operation were far from healthy. The very high summer temperature—90° to 104° F.—and the fact that there seemed to be millions of flies on board may have had something to do with its virulence and prevalence.

For cases of tetanus the various intrathecal injections recommended were used—presumably all the cases had been inoculated when wounded. The treatment of the cases occurring on board here, though pushed to the extreme, seemed in no way to control the disease, and we fell back on morphia and chloroform to relieve the severe spasms. One of the most remarkable outbreaks of tetanus occurred in the cases of frost-bite with (1) moist and (2) dry gangrene, of which we received a number of cases from the Serbian frontier, where there were 23° of frost in the end of November and early in December. The onset was quite sudden, and was fatal within from 16 to 24 hours. This was confirmed to me by other medical officers who dealt with these cases. Treatment in no way affected them.

The external iliac artery was tied three times for hæmorrhage high up from the femoral in Scarpa's triangle.

A few short notes of two cases of special interest are appended.

CASE 1.—Private, received from the trenches on Gallipoli. He was suffering from a wound just to the left of the sternum in the fourth intercostal space partially perforating the sternum. On the fifth day after his arrival on board a severe hæmorrhage occurred, which was temporarily controlled by plugging whilst the patient was being conveyed to the operating table. On removing the plug the bleeding recurred with great violence. The wound being deep and small, I turned up the left breast to expose the intercostal muscles. The bleeding point could not be distinguished, but could be partially controlled by digital pressure. At last, after several attempts, a pair of pressure forceps caught a portion of the severed vessel, and it was then possible to open up the wound, and the bleeding was controlled by the further application of forceps. On passing the finger behind the sternum the nickel casing of a bullet was found lying on the pericardium; it was squeezed flat into a knife-edge, and the heart's action was sawing it up and down, and had divided the internal mammary artery. I removed the bullet casing (see figure), tied the internal mammary in the second interspace, and removed the controlling forceps. The breast, which had been reflected, was replaced and stitched in place. The patient had no further trouble.



Showing size and shape of bullet casing removed from pericardium.

CASE 2.—Private, received on board from the fighting in Serbia. He was in a very bad way: the left patella had been shattered some days previously, and only some fragments remained. The wound in front of the knee-joint was as large as my hand. Temperature 104° F.; pulse 120. The wound was cleansed, dressed, and the leg temporarily put up on a back-splint with foot-piece. The next day, the patient being worse, with severe pain, and the temperature over 104°, he was placed on the operating table. Both synovial pouches in front of the joint and the whole of the joint itself were found full of stinking pus and dirt. I laid the whole joint widely open and flushed and washed out with sterile saline the synovial pouches and the rest of the joint and removed the remains of the patella. A drain of broad rubber tape was placed on the outer side of the knee, draining through an opening made on the outer side of the popliteal space. Finally, with a view of sterilising if possible the entire joint, it was thoroughly flushed out with ether, the ether being allowed to remain in place some two minutes each time, then squeezed out, and replaced with fresh; this was repeated some half-dozen times. That night the temperature fell to 99·4°, and in the morning was only just above normal. The wound throughout was dressed with dry sterilised gauze, wrung out in sol. hyd. biniod., 1 in 1000, made practically dry. The drainage-tape was removed at the end of 14 days. From the day of the operation the patient never looked back—from being almost a skeleton he became fat and healthy. The granulating wound, which was, of course, very extensive, after six weeks I grafted in about 14 places, of which 11 grafts took. When healed over the leg was put up in plaster-of-Paris, covering the knee-joint and extending 6 inches above and below the joint. The patient was daily carried on deck, and within three months of coming on board was able to walk about the ship with the nominal assistance of a walking-stick, which, however, he used but little. There was, in spite of the loss of the patella, a certain amount of power of extension left.

Medical News.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the quarterly examination in Practical Pharmacy held on April 12th the following candidates were successful:—

Ernest Horace Bryant and William Barnes Buer, Guy's Hospital; Horace Braithwaite Bullen, Cambridge University and St. Bartholomew's Hospital; Charles Grinling Bunn, Cambridge University and Charing Cross Hospital; Benjamin Young Harper Christmas, Middlesex Hospital; John Rudolph Cox, Guy's Hospital; Edward Ernest Elt, Charing Cross Hospital; Mendel Gourevitch, London Hospital; Norman Bernard de Medina Greenstreet, Cambridge University and St. Thomas's Hospital; Oliver Halstead and Walter Ralph Gill Hearnden, Guy's Hospital; Gilbert Rashleigh Hull, St. Thomas's Hospital; John Powell Jones Jenkins, University College, Cardiff, and Westminster Hospital; Montagu Horace Jupe, London Hospital; Salomon Kadinsky, Brussels, King's College, and Westminster Hospital; Charles William Lakin, Birmingham University; Archibald Magill, Guy's Hospital; Ahmed Othman, King's College; Gerald Richardson Sharp, London Hospital; Jacques Spira, St. Thomas's Hospital; Doris Kathleen Shuttleworth, Leeds University; Thomas Cowley Stephen, Manchester University; Ronald Henry Tasker, Bristol University; Joseph Stanley Thomas, London Hospital; John Henry Tighe, Birmingham University; Jose Victory, Guy's Hospital; and Arthur Winfield, Cambridge and Liverpool Universities.

UNIVERSITY OF LONDON.—At examinations held recently the following candidates were successful:—

SECOND EXAMINATION FOR MEDICAL DEGREES, PART II.

Iskander Mikhail Abd-El-Said, King's College; Julia Bell and Hilda Crichton Bowser, London School of Medicine for Women; John Vernon Cannadine Braithwaite and William Mark Brown, Guy's Hospital; Michael Waldo Boone Bulman, London Hospital; *Alix Jeanne Churchill, London School of Medicine for Women and King's College; Harris Cohen, University College, Cardiff; Hyman Solomon Cohen, London Hospital; Morris Cohen, Guy's Hospital; *Simeon Moses Cohen, University College, Cardiff, and St. Bartholomew's Hospital; Ursula Beatrice Cox, London School of Medicine for Women; James Fanning, London Hospital; Raymond Eustace Ford, University of Sheffield; Reginald Stafford Foss, St. Thomas's Hospital; Pinkus Joseph Freilich, King's College; Dennis Herbert Geffen, University College; Jacob Gorsky, King's College and Westminster Hospital; Dorothy Margaret Greig, †¶Hilda Treloggen Haggett, *Edith May Hall, and Joan Margaret Redford Harris, London School of Medicine for Women; †Henry Lewis Heimann, University College; *Oscar Stanley Hillman, Middlesex Hospital; Graydon Hume, Guy's Hospital; Hassan Kamal, King's College; *Reginald Cyril Bell Ledlie, Guy's Hospital; Gdal-Leizer Levin, King's College; Hyman Jacob Levy, University College, Cardiff, and St. Bartholomew's Hospital; Leslie Lyne, Guy's Hospital; Charles Dundas Maitland, St. Thomas's Hospital; Ida Caroline Mann, London School of Medicine for Women; Grant Massie, Guy's Hospital; ¶Kathleen Harding Matthews and Sybil Gertrude Overton, London School of Medicine for Women; Jal Pestonji Padshah, University College; ¶Dorothy Pantin, London School of Medicine for Women; Wilfrid Walter Payne, Guy's Hospital; Norah Dorothy Pinkerton and Beatrice Davidine Pullinger, London School of Medicine for Women; Charles Nathaniel Read and Henry Elliott Reburn, King's College; Eleanor Margaret Reece, London School of Medicine for Women; Rowan William Revell, University College; Esther Rickards, London School of Medicine for Women; Samuel Rosenschein, Charles Herbert St. John, and Albert Ernest Sawday, Guy's Hospital; Ruth Mary Scutt and Olive Ballance Sharp, London School of Medicine for Women; Campbell Shaw, St. Bartholomew's Hospital; Marguerite Garnett Sheldon, University of Liverpool; Ernest Livingstone Sergeant, London Hospital; Vanda Patten Thomas, London School of Medicine for Women; Alfred Basil Keith Watkins, London Hospital; Eric Roland Webb, Guy's Hospital; and Jane Edith Wood, University of Leeds.

* Distinguished in Anatomy. † Distinguished in Physiology.
¶ Distinguished in Pharmacology.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates were successful:—

Materia Medica and Pharmacy.—H. P. Hodge, Oxford; J. Stephen, Manchester; and T. T. Tiplady, Durham.

Anatomy.—L. Bernstein, King's College; K. J. H. Davies, Guy's Hospital; J. L. Delicati, Bristol; J. Flanagan, Liverpool; H. D. Hoggard, Middlesex Hospital; J. S. Jones, University College Hospital; M. S. Jones, Manchester; M. Korn, London Hospital; L. E. Lewis, Cardiff and Glasgow; A. McKenzie, Guy's Hospital; J. A. Marriott, Manchester; G. G. Newman, London Hospital; H. E. Reburn, King's College; W. H. Shipway, Bristol; N. G. Thomson, Cambridge; T. T. Tiplady, Durham; and W. G. D. H. Urwick, St. Bartholomew's Hospital.

Physiology.—L. Bernstein, King's College; K. J. H. Davies, Guy's Hospital; J. L. Delicati, Bristol; J. Flanagan, Liverpool; H. D. Hoggard, Middlesex Hospital; W. T. Johnson, Birmingham; M. S. Jones, Manchester; M. Korn, London Hospital; L. E. Lewis, Cardiff and Glasgow; A. McKenzie, Guy's Hospital; J. A. Marriott, Manchester; G. G. Newman, London Hospital; H. E. Reburn, King's College; S. K. Rigg, Bristol; S. Robinson, Belfast; W. H. Shipway, Bristol; N. G. Thomson, Cambridge; W. G. D. H. Urwick, St. Bartholomew's Hospital; and A. A. Weinger, King's College.

ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At examinations held recently the following candidates were successful:—

SECOND EXAMINATION.

Lizzie Robertson Clark, Angus Macdonald, Frank Arthur Smorfitt, George Coote Field, Donald Macdonald MacLeod, Robert Berry Forgan, Walter Granville Carew, Thomas Arnoldus du Toit, John Binnie Taylor, and William Harvie Kerr.

Physiology.—John Murray.

THIRD EXAMINATION.

Thomas Blaney, Thomas Ferguson Minford, Alan Herbert Brookr Hudson, Hugh William Howatson, William Gibb, Jung Bahadue Singh, Rebecca Goodman, Andrew Wood Smith, Norman Joseph Patterson, and John Alfred Alexander Duncan.

Materia Medica.—Andre Antoine Lamaletie, **Alexander Forsyth Caddell, Philip George Bainbridge, and Charles Leonard Webb Fleming.**

FINAL EXAMINATION.

William Archibald Mein, John Adami, Frederick Joseph Jack, Alfred Edwin Elliott, and William McElroy.

Medicine.—John Boyd and Samuel Amery Faulkner.

Surgery.—William Ulic Desmond Longford, Phœbe Foott, **Frank Moffat Haldane Sanderson, and Jackson Baird Minford.**

Midwifery.—William Ulic Desmond Longford, **Harold Congoult Smith, Frank Moffat Haldane Sanderson, John Lavens West, and Jackson Baird Minford.**

Medical Jurisprudence.—**Hendrik Wildeboor, Daniel Colin McNair, Lewis Windermere Nott, Eliza Jean Stuart, Mahmoud Abdel Kader Mofreh, Ernest Ebenezer Bronstorph, and James Henry Brown.**

UNIVERSITY OF GLASGOW.—In the examination for the degrees of Bachelor of Medicine (M.B.) and Bachelor of Surgery (Ch.B.), held recently, the following candidates were successful in the subjects indicated—A., anatomy; P., physiology; M., materia medica and therapeutics; Path., pathology:—

John Smith Aitken (A., P.), Carl Otto Anderson (M.), John David Arthur (M.), William Barras (Path.), Alexander Shanks Bisset (M.), Donald Cameron Bowie (Path.), Donald Campbell Buchanan (Path.), William George Burns (M.), Malcolm Chalmers (M.), Alexander Ebenezer Cochrane (Path.), Alexander Conner Connell (Path.), George Michael Cooper (A., P.), Cyril Lockhart Cottle (M.), Harold Livingstone Coulthard (M.), Edward Mitchell Erskine Cumming (Path.), Andrew Murdoch Davidson (M.), John Donald (M.), John Campbell Dow (M., Path.), Basil William Henry Fergus (M.), Thomas Fleming (Path.), Allan Donald Fraser (M., Path.), Kenneth John Alexander Gillanders (Path.), George Osmond Grant (M.), Peter Fife Auchinachie Grant (Path.), James Alexander Moore Hall (A., P.), James Anthony Hamilton (M., Path.), John Forrest Hamilton (M.), Humphrey Josh Hollis (M.), George Jamieson (P.), John Alexander Jenkins (Path.), Arthur Kennedy (M., Path.), John Kirk (M.), James Campbell Laurie (M., Path.), Douglas Marshall Lindsay (A.), Alan James MacArtney (M., Path.), Duncan MacColl (Path.), Robert M'Courtney (M.), Walter Stewart M'Intyre (A., P.), Donald Mackenzie (A., P.), Andrew Aird M'Laughland (A., P.), Angus Maclean (M., Path.), Donald Maclean (M.), John Macleod (M., Path.), Roderick Montague Macpherson (P.), John Spence Meighan (M.), Sylvester Henry Meiring (M.), George Macleod Millar (A., P.), Livingstone Mitchell (M.), John Nicol (M.), John Nicolson (Path.), John William Peden (M.), Andrew Glen Petrie (A., P.), John Browning Potter (Path.), Rahmat Ullah Qureshi (Path.), Francisco Ribeiro (M.), James Morrison Ritchie (M.), Ian Menteith Robertson (Path.), Joseph Sachs (P.), William Scotland (Path.), William Scott (A., P.), Ralph Paterson Smith (M., Path.), Herbert Harold Spencer (A., P., M.), Donald Stewart (P., M.), Alexander Strang (A., P.), John Leonard Turpie (A., P.), Alexander Ross Waddell (Path.), James Alexander Walls (A.), Hugh Wands (M., Path.), and William Alexander Wilson (A., P.).

Women.—Ellen Davidson Anderson (Path.), Marjorie Mason Anderson (A., P.), Annie Burns Cameron (P.), Grace Chatterton (Path.), Louise Denil (A., P.), Charlotte Ann Douglas (A., P.), Margaret Hogg Grant (M.), Margaret Gray (A., P.), Lillias Beverley Hardie (Path.), Alison Mary Hunter (M.), Margaret Logan (P.), Isabella Quarrier M'Fadzean (Path.), Ellen Thomson MacKenzie (A., P.), Annie Isabel Christian Maclardy (A., P.), Florence Frances Mitchell Milne (M.), Kathleen Nicol (M.), Vida Johnston Perry (M.), Margaret Nelson Robertson (M.), Eliza Dorothea Sandison (P.), Katherine Scott (M., Path.), Jane Elder Shortt (Path.), and Catriona Sinclair (P.).

Third Professional Examination (Old Regulations).—Thomas Crawford (M.).

The following have passed in Medical Jurisprudence and Public Health of the Fourth Professional Examination (New Medical Ordinance):—

Roderick Bethune, Donald Campbell Buchanan, Basil William Henry Fergus, George Keith Fulton, James Biggam Douglas Galbraith, Adam Smith Goudie, James Charles Hendrie, Donald Macqueen, William M'William, Archibald Sutherland Strachan, and Joseph Turner Taylor.

Women.—Annetta Gillies Turnbull Anderson, Mabel Nellie Blake, Margharita Mary Lamont Couper, Grace Anderson Fleming, Jane Evelyn Hanson, Janet Whyte Hepburn, Mary Reid Knight, Agnes Purcell M'Gavin, May Constance Boughton Leigh, Margaret Turner M'George, Jessie Napier Robertson, Agnes Petrina Routledge, Dorothea Helen Suttie, and Lydia Ida Huber Torrance.

The following have passed in Medical Jurisprudence and Public Health of the Third Professional Examination (Old Medical Ordinance):—

Thomas Watson Carstairs, Thomas Fleming, and John Nicolson.

The following candidates passed the whole of the examinations for the above degrees:—

John William Waddell Baillie, Monindra Nath Bhattacharjee Archibald M'Allister Blackwood, Mabel Nellie Blake, John MacDougall Clark, Andrew Dick, Samuel Norman Dykes, Lewis Livingstone Fotheringham, Margaret Hutchison Glen, William Hadden Gordon, David Heard, Frederick William Hebblethwaite, Henry Fielden Hollis, James Robert Riddell Holms, William Hogarth Kerr, James Liddell, Frederick Colquhoun Logan, Kenneth M'Alpine, Arthur Daniel Clark M'Gowan, May Elizabeth MacIver, Donald William Morison MacKenzie, William Duff Miller, William Harold Palmer, James Walker Patterson, May Isabella Turner Reid, Angus M'Alpine Scott, Henry Buchan Sergeant, Andrew Wauchope Smith, Clarence Lorraine Somerville, Douglas Stuart Stevenson, Pat Adam Stewart, Marion Watson, Mary MacLean Weir, Robert Wiggins, and John Thomas Wylie.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE, SCHOOL OF PHYSIC.—At the recent Hilary examinations the following candidates were successful:—

INTERMEDIATE MEDICAL EXAMINATION.

Part II., Anatomy and Physiology.—Wonter de Vos Scholtz, Harris Cohen, Henry Allman Lavelle, Donal Victor Latham (omitting Organic Chemistry), and Johan Frederick Wicht (omitting Organic Chemistry).

Applied Anatomy and Applied Physiology.—Thomas Henry Coolican (high marks), Reuben Resnekov (high marks), Richard Counihan, Noelle Long, Henry Blundell Van der Merwe, John Gerrard Holmes, Alewyn Johannes Vorster, Gertrude Rice, John Charles Callanan, Albert Hugh Thompson, Jan Jacobus Gabriel de Kock, Victor George Walker, John Farneworth Sheppard, Arthur Leslie Gregg, Cyril Daniel Brink, Becher FitzJames Haythornthwaite, Cecil Joseph Quinlan, Abgar Read Alden, Richard Dominic Murphy, Thomas James Russell Warren, Richard William Shaw, Harris Cohen, William Andrew Byrn, Samuel John Laverty, William Richard Burns, Athanas Blagoff, William Joseph Hogan, Jessie Gilbert, Lionel Wigoder, Johannes Tobias Mynhardt, and Alfred John Beckett.

FINAL EXAMINATION.

Part I., Medical Jurisprudence and Hygiene, Materia Medica and Therapeutics, Pathology.—William Leech Young (high marks), Robert Meade Daly Devereux (high marks), Johannes Cornelis Fouché, Eric James Lyndon, Leslie James Nugent, John Benson McGranahan, Eric Stuart Mack, Kenneth MacGregor Greer, Olive Gertrude Blackam, Frank Ferguson, Benjamin Dames Merrin, Frederick John Dymoke, Francis John Gerrard Battersby (omitting Pathology), *Arthur Leslie Gregg, *Francis Assisium McHugh, *Bryan Austin McSwiney, *William Alfred Shannon, *Eric Reginald Tivy, and †Margaret Wolfe.

* Pathology completing examination.

† Medical Jurisprudence and Hygiene completing examination.

Part II., B.A.O., Midwifery and Gynæcology.—Edward D'Arcy McCrea, Alexander Richard Barlas, Bryan Austin McSwiney, Margaret Wolfe, Percy Crowe Parr, Joseph Roland Brennan, Hastings Harley Molloy, Thomas Tabuteau, Paul Herbert Shelly Smith, Patrick Casey, Thomas Hugh Robinson McKiernan, and John James Keatley.

B.Ch., Surgery.—James Arthur William Cullen (high marks), George Bernard Shaw, Henry Banks, Henry James Rice, Paul Herbert Shelly Smith, and Hirsh Brill.

M.B., Medicine.—Alexander Richard Barlas (high marks), Edward D'Arcy McCrea (high marks), James Carter O'Gilvie, Paul Herbert Shelly Smith, William Frederick Wicht, Olive Gertrude Blackham, Pieter Johannes Swanepoel, Willem Petrus Lubbe, Gilbert Marshall, James Arthur William Cullen, Thomas Edward Hill, and Hastings Harley Molloy.

Dental (B. Dent. Sc.).—John Henry James Stuart.

DIPLOMA IN PUBLIC HEALTH (D.P.H.).

Part I., Chemistry, Meteorology, and Bacteriology.—Thomas Kirkwood and Bagenal Harvey Mellon.

Part II., Sanitary Engineering, Vital Statistics, Hygiene, and Epidemiology.—Bagenal Harvey Mellon.

LITERARY INTELLIGENCE.—**Mr. Heinemann** announces the immediate issue of a treatise on Malingering by Dr. A. Bassett Jones and Dr. R. Ll. J. Llewellyn.

THE Council of the Medical Society of London have awarded the Fothergillian medal for 1917 to Sir Leonard Rogers, I.M.S., C.I.E., F.R.S., of the Medical College, Calcutta, in consideration of his work on Dysenteries, their Differentiation and Treatment.

THE Society of the Swedish Physicians (Svenska Läkaresällskapet) has elected Colonel Robert Jones, C.B., Inspector of Military Orthopædics, to be a foreign member of the society. The honour was conferred at the instance of Dr. Haglund, professor of orthopædics, Stockholm, supported by the professor of surgery, Dr. John Berg, and by Dr. Henning Waldenström, lecturer on orthopædics.

ROYAL SOCIETY OF ARTS.—The following lectures will be delivered during April and May on Wednesday afternoons at 4.30:—April 25th, Sir Francis Fox on Flour and Bread; May 2nd, Mr. J. C. Shenstone on Herb Growing in the British Empire; May 16th, Sir C. Arthur Pearson on the Blind Sufferers from the War and their Future Employment.

PAYMENT FOR THE DOMICILIARY TREATMENT OF TUBERCULOSIS IN BELFAST.—A Belfast correspondent writes:—"Three members of the city council of Belfast—Dr. J. D. Williamson, Dr. R. Thomson, and Dr. S. Allworthy—have resigned in order to make their position clear in connexion with payments made to them by the council for the domiciliary treatment of pulmonary tuberculosis (see THE LANCET, April 7th, p. 556). Probably when the new Municipal Bodies Emergency Act is passed the whole question will be put upon an entirely different footing."

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BOYD, R. M., M.B., Ch.B. Aberd., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Braemar District of the county of Aberdeen.

FISHER, H. R., M.B. Camb., Certifying Surgeon under the Factory and Workshop Acts for the Atherstone District of the county of Warwick.

HIGGIN, ROBERT FRANCIS, B.A., M.D., B.C. Cantab., L.R.C.P., M.R.C.S., Acting Medical Officer to the Newton Abbot (Devon) Union Workhouse.

PROCTER, J. A., L.S.A. Lond., Certifying Surgeon under the Factory and Workshop Acts for the Lydd District of the county of Kent.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

ANGLO-RUSSIAN HOSPITAL, 32, Victoria-street, S.W.—Two Surgeons for Russia.

BARNSLEY, BECKETT HOSPITAL.—Honorary Staff for Out-patients (Two Vacancies).

BARROW-IN-FURNESS, NORTH LONSDALE HOSPITAL.—Second House Surgeon. Salary £250 per annum, with board, &c.

BETHNAL GREEN INFIRMARY, Waterloo House, Waterloo-road, E.—Assistant Medical Officer. Salary at rate of £250 per annum.

BOLTON INFIRMARY AND DISPENSARY.—Second House Surgeon. Salary £200 per annum, with board, &c.

BOURNEMOUTH, ROYAL VICTORIA AND WEST HANTS HOSPITAL, Boscombe Branch.—House Surgeon. Salary £125 and extras, with board, &c.

BRADFORD CITY EDUCATION COMMITTEE.—Temporary Assistants to School Medical Officer.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURNLEY, VICTORIA HOSPITAL.—House Surgeon. Salary £160 per annum, with board, &c.

BURNLEY UNION.—Resident Assistant Medical Officer. Salary £300 per annum, with rations, &c.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

BURY AND DISTRICT JOINT HOSPITAL BOARD.—Assistant to Medical Superintendent. Salary £250 per annum, with board, &c.

CHESTER ROYAL INFIRMARY.—Assistant House Surgeon. Salary £150 per annum, with board, &c.

CLINICAL RESEARCH ASSOCIATION, LIMITED, Watergate House, York Buildings, Adelphi, W.C.—Medical Man or Woman for service in Laboratories.

GREAT NORTHERN CENTRAL HOSPITAL, Holloway-road, N.—Resident Medical Officer. Salary £200 per annum, with board, &c.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

HUDDERSFIELD, STORTHES HALL ASYLUM, Kirkburton, near Huddersfield.—Locum Tenens. Salary £7 7*s.* per week, with board, &c.

KENT COUNTY COUNCIL.—Tuberculosis Officer. Salary at rate of £500 per annum, &c.

MAIDSTONE, WEST KENT GENERAL HOSPITAL.—Assistant House Surgeon. Salary £125 per annum, with board, &c.

MANCHESTER, ANCOATS HOSPITAL.—House Physician. Salary £200 per annum, with board, &c.

MANCHESTER, BAGULEY SANATORIUM FOR TUBERCULOSIS.—First Assistant Medical Officer, unmarried. Salary £350 per annum, with board, &c.

METROPOLITAN HOSPITAL, TUBERCULOSIS DISPENSARY FOR THE METROPOLITAN BOROUGHS OF HACKNEY AND STOKE NEWINGTON, Kingsland-road, E. 8.—Temporary Medical Officer. Salary at rate of £500 per annum.

NETLEY, WELSH HOSPITAL.—Medical Officer for Pathological Department. Salary £400 per annum, with board, &c.

NEW HOSPITAL FOR WOMEN, Euston-road, N.W.—Female Assistant Physician and Assistant Surgeon.

NEWCASTLE-UPON-TYNE, ROYAL VICTORIA INFIRMARY.—Four House Physicians, Five House Surgeons, Two Accident-room House Surgeons, House Surgeon to Aural and Ophthalmic Department, House Surgeon to Gynæcological Department, House Surgeon to Skin and Venereal Department, House Surgeon to Out-patient Dressing Department.

NORTHAMPTON GENERAL HOSPITAL.—House Surgeon. Salary £200 per annum, with board, &c. Also Two Junior House Surgeons. Salaries £150 per annum, with board, &c.

NOTTINGHAM GENERAL HOSPITAL.—Two Assistant House Surgeons for six months. Salary at rate of £250 per annum each, board, &c.

NOTTINGHAM, NOTTS EDUCATION COMMITTEE.—Female Assistant School Medical Officer. Salary £300 per annum.

PLAISTOW FEVER HOSPITAL, London, E.—Female Temporary Resident Medical Officer, to take Clinical Charge of the Dagenham Sanatorium for Pulmonary Tuberculosis. Salary at rate of £360 per annum, and all found.

PRESTON ROYAL INFIRMARY.—Resident Medical and Surgical Officer. Salary £120 per annum, with board, &c.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—Two House Physicians for six months. Salary £100 per annum, with board, &c.

ROCHESTER, ST. BARTHOLOMEW'S HOSPITAL, Kent.—Senior Resident House Surgeon. Salary at rate of £300 per annum, with board, &c. Also Clinical Assistant. Salary at rate of £110 per annum, with board, &c.

ROTHERHAM HOSPITAL.—Junior House Surgeon. Salary £150 per annum, with board, &c.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Senior Resident Medical Officer. Salary £200 per annum. Also House Physician (salary £50 per annum, with board, &c.) and Junior Obstetric Physician (salary £62 per annum, with board, &c.), to include duties at Endsleigh Maternity Hospital. Salary given.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SHREWSBURY, SHIRLETT SANATORIUM, Shropshire.—Temporary Assistant Resident Medical Superintendent. Salary £300 per annum.

SOUTH LONDON HOSPITAL FOR WOMEN, 103, South Side, Clapham Common, S.W.—Female House Physician for six months. Salary at rate of £100 per annum, with board, &c.

WEST BROMWICH AND DISTRICT HOSPITAL.—Assistant House Surgeon. Salary £120 per annum, with board, &c.

WEST RIDING OF YORKSHIRE.—Two Temporary School Medical Inspectors. Salary £320 per annum.

WHITEHAVEN AND WEST CUMBERLAND INFIRMARY.—Resident House Surgeon. Salary £150 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Annan, at Brampton, and at Tamworth.

Births, Marriages, and Deaths.

BIRTHS.

KELLOCK.—On April 15th, at 2, Upper Wimpole-street, the wife of Thomas H. Kellock, M.C., F.R.C.S., of a son.

MARSHALL.—On April 10th, at Cambridge, the wife of Russell H. S. Marshall, R.A.M.C., of a son.

MCKELLAR.—On April 17th, at Chester-le-Street, County Durham, the wife of Dr. W. A. McKellar, of a son.

WATT.—On April 9th, Dorothy, the wife of James Watt, M.D., Medical Superintendent, Odsal Sanatorium, Bradford, of a son.

WILSON.—On April 12th, at Devonshire-street, W., the wife of Alex. Wilson, M.D., Captain, R.A.M.C., of Crest House, Putney Bridge-road, S.W., of a daughter.

MARRIAGES.

ACKLAND—BUCKLE.—On April 10th, at St. Mary Abbot's, Kensington, William Robert Ackland, Major, R.A.M.C.T., to Georgina, widow of Henry Buckle, Burma Commission (retired).

BELL—CLAYSON.—On March 19th, at St. Andrew's, Farnham, Surrey, William Ker Bell, Captain, R.A.M.C., to Katherine B. Clayson, of Eastleigh, Farnham.

EGAN—MASON.—On April 11th, at St. James's, Piccadilly, W., Staff-Surgeon Percy Blackwood Egan, M.D., R.N., to Rosalie Stella, youngest daughter of the late Mr. O. A. T. Mason, D.I., R.I.C., of Grangefoyle, Strabane, and of Mrs. Mason, Bray, Ireland.

GRAVES—PADDAY.—On April 11th, at St. Barnabas, Kensington, W., George Henry Fullarton Graves, Temporary Lieutenant, R.A.M.C., to Linda Maud, of Holland-road, Kensington, W., eldest daughter of the late Reginald H. Paddy, of Singapore.

WILSON—HODGE.—On April 12th, at Hyndland Church, Glasgow, George Hanswell Wilson, M.B., Ch.B., to Amy Lawrence, youngest daughter of Mr. and Mrs. William Hodge, Montgomerie-drive, Glasgow.

DEATHS.

HAWES.—On April 10th, through the sinking of H.M.H.S. *Salta*, Godfrey Charles Browne Hawes, of Pangbourne, Berks, Temporary Captain, R.A.M.C., J.P., M.R.C.S., L.R.C.P., L.S.A.

JONES.—On April 13th, after a short illness, at his residence, 16A, Abercromby-square, Liverpool, aged 53 years, Hugh Richard Jones, M.D.

KING.—On April 11th, at S. Cyprian's, Stratton, Cornwall, John King, M.R.C.S., J.P., in his 73rd year.

LUNN.—On March 5th, at a hospital in India, as the result of an accident, Captain Henry Anderson Lunn, R.A.M.C.

POTTER.—On April 9th, 1917, suddenly, at Brighton, Henry Percy Potter, M.D., F.R.C.S., D.P.H., of Kensington Infirmary, for 37 years Medical Superintendent, aged 63 years.

RUTHERFORD.—On April 11th, at St. Thomas's Hospital, London, Leonard Trevelyan Rutherford, M.A., M.B. Cantab., aged 29.

TAYLOR.—On April 10th, at Windsor, Surgeon-General Sir William Taylor, K.C.B., late Director-General, Army Medical Service, aged 74 years.

THOMPSON.—On April 9th, at Grenville House, Bideford, Charles Sinclair Thompson, M.B.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

DOCTORS OF MILITARY AGE: THE SQUABBLE AT LETTERKENNY.—An Irish correspondent writes: "An extraordinary scene occurred at a meeting of the Letterkenny Board of Guardians on April 13th. It will be recollected that at a recent election for dispensary doctor there were two candidates, Dr. W. N. Walker and Dr. J. P. McGinley. The latter was elected, but as he was of military age the Local Government Board refused its sanction. The guardians adhere to their decision, and an amusing situation has arisen, Dr. McGinley treating patients at the guardians' dispensary and Dr. Walker at his private surgery, the tickets authorising each doctor to attend patients being signed by the guardians, according to their view as to who is really the legally appointed doctor. At the last meeting of the board, when the pay-sheets of the doctors were submitted for the chairman's signature, the first pay-sheet was snatched from him, and he himself was forcibly ejected from the chair. A wild scene of disorder followed."

Notes, Short Comments, and Answers to Correspondents.

MEDICAL NOTES IN HISTORICAL MANUSCRIPTS: THE STUART PAPERS.

WE give below the concluding excerpts from Part VI. of the Stuart Papers. The first and second instalments appeared in our issues of April 7th (p. 558) and 14th (p. 594) respectively.

Health of James III.—Operation for Fistula.

Pope Clement XI. to James III.—1716, May 19, Santa Maria Maggiore, Rome.—Granting him permission, on account of his health, to eat meat, eggs, &c., on fast days, with an exception as regards meat in Holy Week.

The Duke of Mar to Lieut.-General Dillon.—1716, Oct. 4.—"James has been a good deal out of order for some time with the piles, and though he be now in a fair way of recovery, I hope, yet he is not so easy that he can write."

Queen Mary to the Duke of Mar.—1716, Oct. 10.—"As soon as I had read your letter I sent for Mr. Inese, who you know may be trusted, and consulted with him which way wee should take to gett a good chirurgien to send to Avignon without letting so much as himself know who he went for; wee resolved to employe Dr. Maghie in this affair, since I dare not appear in it myself; he is honest, and is acquainted with several good chirurgiens, and I hope will keep the secret which I earnestly recommended to him. I was in hopes all this would have been done this morning, and ther was a chair ready with post horses, but an houre ago Dr. Maghie brought me the enclosed from Mr. Inese and gave me an account of all he has done in this affair, which I made him put in writting, and here I send it you, but I will not seal up this letter till 6 o'clock, by which time Dr. Maghie has promised to lett me know positively whether Guerin will go and what day. If wee cannot prevail with him, wee must take one that he will answer for; nay, he says he cannot go himself without consulting Marechal, of whom he mucch depends, so that wee cannot hinder that, but Dr. Maghie assures me that non of them thinks any mor than that it is a man of quality com out of England that hides himself and will not be known to any, which I hope they will still beleeve and suspect nothing els. In all the trouble I am in, which you may much easier imagine than I can express it, it is a comfort to me to have you near the King. ..... I am confident you will be of great use to him in persuading him to be exact in performing the doctors' and chirurgiens' prescriptions and in keeping company and businesse from him."

The enclosure referred to in the above is as follows:—

L. Inese to Queen Mary.—1716, Saturday, Oct. 10, 10 A.M.—"Your Majesty cannot imagine what difficulty there is to find an able surgeon that will go so far on such short warning, they being all engaged with patients they cannot quit on a sudden. I thought it necessary to send Dr. Maghie to inform you of what they say, he having spoke with them, and all of them being of opinion that there can be no danger in some days' delay. The courier that came up has been very indiscreet, having told everybody he was sent by the King to your Majesty. You will be pleased to give your orders to Dr. Maghie who has taken great pains last night and this morning."

Statement by Dr. John Maghie.—"As soon as I received the Queen's orders last night from Mr. Inese I went immediately to Thibaut, the chief surgeon in the Hotel Dieu, one famous in the case. He told me it was impossible for him to make the journey on any account. He recommended Collignon, with whom I was early this morning, and likewise with Monsr. Arnaud, both so engaged that they cannot go. Afterwards I went to Guerin, one as expert as any of the others. He likewise cannot go immediately, but I have hopes to prevail with him in a few days. Observe that Thibaut, Arnaud, and Guerin agree that there can be no danger in delaying the operation for some eight, ten, or twelve days—nay, Arnaud said fifteen, or three weeks. However, no time shall be lost in sending one as soon as possible in whom one can have entire confidence."

L. Inese to Queen Mary.—1716, Sat., Oct. 10, 4 o'clock.—"Dr. Maghie has just come in, and desires your Majesty to be informed that he has been again with Dr. Guerin, who now thinks he can part from this in three days, but he must first speak with M. Marechal on whom he depends. He will give his positive answer to-morrow. As most of such people have an eye to their own interest and it cannot be told them who the person is they are to trust, this M. Guerin made a bargain what he is to have, as he must be absent three weeks or a month and lose his practice, which is considerable, in the meantime. The doctor thinks he should be offered 3000 livres to be secured him when the operation is over, and all his charges going and returning. If you approve, pray let me know and the offer shall be made to-morrow when I see him, or in the manner you think fit, but too great an offer might probably give him suspicion who the person is. He may be told that if all succeeds he shall have a recompense over and above."

L. Inese to the Duke of Mar.—1716, Oct. 13, Paris.—"You will receive this from M. Guerin, who is by all esteemed one of the ablest chirurgeons of Paris and of the greatest experience in the operation he now goes about, and has been always successful in all he has undertaken. He is an élève of the famous M. Marechal and employed by him in the most difficult operations of this kind. I have given him assurance of 3000 livres, besides all his charges and of a reasonable present besides when the operation is happily over. I dared not offer more for fear of giving him suspicion, nor could I offer less, being informed he gains sometimes 3000 livres in a month without going out of Paris. He only knows it is a person of quality he is to treat who will not be named for fear of alarming his relations, but suspects it is either Ormonde or Mar."

Queen Mary to the Duke of Mar.—1716, Oct. 17, Chaillot.—"I dare not send the enclosed to the King for fear the operation should be over before this comes to Avignon; but I dare not omitt sending it to you that you may know what is said and take your measures accordingly. The King and the Duke of Ormond know this fair lady [Olive Trant] very well. She certainly means well, but one must not believe all that is sayd. ..... I pray God direct you and the Duke of Ormonde to do what's best, but if the operation be not made the King should be informed of this and decide himself."

The enclosure referred to in the foregoing is as follows:—

Olive Trant to Queen Mary.—"The surgeon, Marechal's nephew, who is gone to the King, is reputed to be very stupid. Chirac, whom I have just seen, tells me there is one Barancy, a surgeon now living at Montpellier, who is one of the most able in France and it is important that he should attend the King with Guerin, who is not so able as might be wished. There is still time to send Barancy. Your Majesty will have the kindness not to quote Charac as to what I have said about Guerin but he is willing to be [quoted?] about Barancy's ability."

The Duke of Mar to Sir H. Paterson.—1716, Oct. 21.—"When I tell you that James was this morning cut of a fistula *in ano* you will not wonder that I am in a hurry, having letters to write everywhere upon it. I thank God it is well over and he out of danger. He endured the operation with all the fortitude in the world. I was by and was grieved with the King, but charmed with the spirit he showed. The operation lasted about five minutes and was very well performed by Guerin, a chirurgeon we had sent for from Paris. He had ten cuts of the knife and scissors, but the wound is not deep. Both the doctor and chirurgeon assure us that there is no further danger and he is as calm and tranquil as possibly can be expected, without the least appearance of any fever. They will report him dead, I doubt not, who wish it; therefore it would do well that you could have a right account of it put into your newspapers. Since it was God's pleasure he should have this illness, it has not taken him in an unlucky time, for it will give him and his friends time to look about them before they be sent a travelling, if that must needs come. It will be two months before he be in a condition to go anywhere, and sure they will not be so barbarous as to force him to it before he be safe, and before two months expire 'tis hard to tell what may cast up." (Further letters show that James's recovery was slow, but without complications.)

The Duke of Mar to Monsieur Stiernhock.—1718, May 24.—"My master [James III.] had been a little indisposed for a few days before he had the news of the Queen's death, and had some symptoms of an ague, so that account came very unseasonably for that and many other reasons. His indisposition was but slight, occasioned, as far as we can judge, by the sudden change from excessive heat to very cold, which had the same effect on more of us, but I hope a few doses of the bark will carry it off."

James III. to his cousin, the Duchess of Hanover.—1718, Friday, May 27.—"A slight recurrence of tertian fever prevents me from writing to you with my own hand."

James III. to the Prince De Vaudemont.—1718, June 26, Urbino.—"I should have long since sought some consolation from you had I not been for two months prostrated by a fever which has prevented me from the least application."

Lieutenant-General Dillon to the Duke of Mar.—1718, Saturday, June 4.—"I am much troubled to find the King's ague continues. I hope it will soon be over and beseech the Almighty to comfort him in his just affliction. Nairne advised me of the King's taking a vomit 7 May and of his being somewhat weak two days after. No violent remedy can be good for his constitution, and it is not very usual to make an experience on persons of his rank, it being a nice point and not practised except in great extremities. The doctor ought to know best, though it be very sure his prescription will meet with little or no approbation among the physicians here."

COMFORTS FOR THE FORCES.

Mr. John Penoyre, writing on behalf of Sir Edward Ward, Director-General of Voluntary Organisations, says that last year the interval between the last cold night of spring and the first chills of autumn was overestimated, and that this year a vast store of sweaters, mufflers, helmets, mittens, and socks will be wanted by August 1st. These should be sent, when the time draws near, either to the D.G.V.O.'s Depôt, 45, Horseferry-road, S.W. 1, or to Mr. Penoyre, 8, King's Bench Walk, Inner Temple, E.C. 4. Easily knitted patterns of any of the articles mentioned can be had free on application.

ECONOMY IN RUBBER GLOVES.

To the Editor of THE LANCET.

SIR,—Referring to a letter appearing in your issue of March 31st on the above subject, I have examined these repairs, and think that, from the surgeon's point of view, they are satisfactory. From the public point of view, it would appear that the saving to be effected certainly warrants an immediate trial of this method by all hospital authorities, and in particular by the Royal Army Medical Corps controlling the military beds.

I am, Sir, yours faithfully,

Cavendish-square, W., April 9th, 1917. W. ARBUTHNOT LANE.

To the Editor of THE LANCET.

SIR,—In your issue of March 31st last appeared a letter on the repair of surgical rubber gloves by a new process. The amount spent on these gloves is understated; some hospitals must spend £500 or more a year on them. I have used gloves repaired in the manner described for some years at the Leicester Royal Infirmary. The puncture repairs are so small as to be almost unnoticeable. Of course, when rubber has become brittle from repeated sterilisation at a high temperature any repair is useless. A fair proportion of gloves, however, are injured whilst the rubber is still in good

condition, either by puncture with the needle or by manipulation (more particularly in bone operations), or even by pulling them on roughly. Most of these latter are capable of repair. The proportion repairable, however, must vary very considerably, depending on the class of operation, &c. Many hospitals repair their own punctures with rubber solution; even they, however, would be well advised to try the Leicester method for larger tears.

I am, Sir, yours faithfully,
HENRY J. BLAKESLEY, F.R.C.S. Eng.,
Major, R.A.M.C.T.; Senior Honorary Surgeon, Leicester Royal Infirmary.
April 14th, 1917.

THE CHEMICALISING OF CORPSES.

THERE appear to be good reasons for believing that the Germans are utilising the bodies of their dead by committing them to a chemical treatment which, for one thing, yields fat, and, for another, a nitrogenous powder which serves, so it is stated, to enrich pig-feed, and, yet for another, the mineral phosphate of the bones to be used as a fertiliser in the field. The recovery of fat by what may appear to be a gruesome policy means, of course, a source of material for the making of glycerine and its nitro-derivative. The total amount of fat in the human body varies immensely, but it may be said to range from 2·5 to 5 per cent. of the body weight. It is easy to see that in a period of heavy casualties this method for the disposal of the dead will yield a very material amount of glycerine. Thus, a thousand bodies at an average weight of 10 stone (140 lb.) would yield on an average of a 3 per cent. basis of fat per body weight about 2 tons of fat capable of being turned into a tenth of its weight of glycerine—i.e., 4 cwt. As the published number of killed far exceeds this, the output of glycerine may have been increased proportionally, not to mention the soap incidentally produced. The dividends of the enterprising company known as the Kadaververwertungsanstalt (Corpse Utilisation Establishment) may, according to this calculation, be quite satisfactory to the directors and shareholders, enabling them to face criticism with complacency.

PROLONGED NASAL FEEDING.

To the Editor of THE LANCET.

SIR,—A man was admitted to this asylum in 1885 and has just died here at the age of 81. For several years he had to be spoon-fed after his admission, but for the last 21 years and 7 months he was fed three times daily through the nasal tube. He enjoyed excellent health until the last three months, when his health began to fail. I never heard of his taking a drink of water for all these years, but during the last two days of his life he took warm milk from a fellow-patient, but not from an attendant. The following was his daily diet scale:—

Breakfast: One quart of milk, two eggs, and 1½ oz. of sugar. Dinner: One quart of beef tea, or beef fluid made from bovril or oxo, and one or two potatoes, mashed fine enough to go through the nasal tube. Supper: One quart of milk, one egg, and 1½ oz. of sugar.

Is this a record in prolonged nasal feeding?

I am, Sir, yours faithfully,
E. E. MOORE, M.D. Dub.,
Medical Superintendent.
Donegal District Asylum, Letterkenny, April 13th, 1917.

HEALTH OF ST. LUCIA.

A REPORT on the colony of St. Lucia for the year 1915-16 has just been presented to Parliament. From this it appears that the population is estimated to consist of 24,115 males and 28,167 females—total 52,282—a slight increase as compared with the previous year. The birth-rate for 1915-16 was 33 per 1000 of the population and the death-rate 19·7 per 1000. There were two deaths from snake-bite and one from scorpion-bite. All the medical officers report the health conditions of the year to have been favourable. The hookworm campaign, inaugurated at the expense of the International Health Commission, continued its work under the direction of Dr. Stanley Branch, a local district medical officer seconded for this purpose; and side by side with this campaign the Government is adopting measures for the improvement of the sanitary conditions in the colony generally. The Victoria Hospital at Castries is the one general hospital for the colony, and the daily average number of patients was 70. The construction of a wing for private paying patients has been commenced. Small buildings are provided in the out-districts at Soufrière, Dennery, and Vieux Fort which are used as casualty hospitals for accident and emergency cases, and there are visiting stations at various points where medical officers attend regularly on fixed days for the treatment of out-door cases of sickness.

The yaws hospital, which is in the vicinity of the Poor Asylum at Malgretoute, had a daily average of 43·2 patients. The voluntary influx of patients for treatment with arsenobenzol continued unabated during the year, and 443 cases were treated. The medical officer in charge, Dr. A. F. Hughes, reports that up to date he had treated 1188 cases, and that out of this number there had been 63 cases of recurrence of the disease. In this latter connexion the medical officer refers to the difficulty of his distinguishing between bona-fide recurrences and cases of reinfection.

SPRUE.

REFERRING to the annotation which appeared under the above heading in our issue of last week, Mr. John Ward, of the Crookes Laboratories, states that the use of collosol argentum in this disease was mentioned in papers read before the annual meetings of the British Medical Association in 1913 and 1914, notably by Mr. James Cantlie. Further experience, he adds, indicates the alternate use of collosol argentum and collosol iodine—of course, by internal administration.

Recruits.—The fees should, in our opinion, be included in our correspondent's return for income-tax, as the profit arising therefrom can scarcely be defined as profit arising from a single or casual transaction outside the usual scope of the profession. The point might be put before the district surveyor of taxes, whose advice is usually sound and impartial.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETING OF SECTION.

Friday, April 27th.

STUDY OF DISEASE IN CHILDREN (Hon. Secretaries—A. S. Blundell Bankart, E. A. Cockayne, C. P. Lapage): at 4.30 P.M.

Cases:

Dr. F. Parkes Weber: (1) Lipodystrophia Progressiva in a Male; (2) Congenital Letter-blindness—Congenital Alexia and Agraphia without Aphasia; (3) Bilateral Optic Nerve Atrophy in a Child with Positive Wassermann Reaction and History of Infantile Convulsions.

Specimen:

Dr. E. A. Cockayne: A Case of Congenital Defect of the Duodenum in which Bile was Found both Above and Below the Absent Portion.

Paper:

Dr. H. C. Cameron: Status Lymphaticus from the Clinical Standpoint.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

Museum Demonstrations (Pathology) for Medical Students and Practitioners and First-Aid and Ambulance Students:—

MONDAY.—5 P.M., Mr. S. G. Shattock: Gunshot Injuries.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY.—4 P.M., Lecture II.:—Dr. C. Porter: Citizenship and Health Questions in War Time. Followed by a discussion.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.

FRIDAY.—5.30 P.M., Dr. J. D. Grant: The Organs of Hearing in Relation to War.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, April 18th, 1917.

Date.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Tem.	Wet Bulb.	Dry Bulb.	Remarks.
April 12	...	75	46	34	36	38	Cloudy
,, 13	0·01	89	51	33	36	38	Fine
,, 14	...	68	50	38	43	45	Cloudy
,, 15	...	94	51	38	36	39	Fine
,, 16	0·15	77	47	35	39	42	Fine
,, 17	0·12	79	47	38	37	40	Cloudy
,, 18	0·09	70	52	38	45	45	Raining

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C. 2.

MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d*. The rates of subscription remain as revised in October.

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Y.—Surg. A. Young, R.N.

The Lettsomian Lectures
ON
WAR SURGERY OF THE ABDOMEN.

Delivered before the Medical Society of London

BY CUTHBERT WALLACE, B.S. LOND., F.R.C.S. ENG., C.M.G.,
SURGEON TO ST. THOMAS'S HOSPITAL; CONSULTING SURGEON, BRITISH EXPEDITIONARY FORCE.

LECTURE III.[1]

Delivered on March 23rd, 1917.

WOUNDS OF PARTICULAR ORGANS (*continued*).

Large Intestine.

Frequency.—The colon was perforated in 258 cases among 965 operations.

Associated injuries.—The small intestine is the organ most frequently injured with the great gut. The stomach goes with the transverse colon, the spleen and kidney with the splenic flexure, the liver and right kidney with the hepatic flexure. In speaking of side-to-side wounds, we have given some instances of curious injuries, and one may recall here a case where the left kidney and the posterior surface of the ascending colon were the only lesions found.

The injuries of the large intestine are really similar to those of the small gut. The differences that are to be noted are due to its larger size, the absence of coils, the absence of mesentery, and to its proximity, in some portion of its extent, to bone.

1. *The large size of the tube* leads to a preponderance of tears or perforations, but instances are met with in which the whole lumen is completely divided, and this happens both in the fixed portion and in that endowed with the mesentery. This complete division is, I think, due to a collapsed condition of the intestine when it may be, as is well known, but little bigger than the small intestine.

2. *Absence of coils.*—This means that multiple injuries are not common, and when they occur are not so numerous as in the small intestine. The multiple injuries are found at the bends. In one case which may be mentioned there were six perforations—two in the ascending, two in the hepatic flexure, and two in the transverse colon. In another case there were three wounds in the cæcum and ascending colon and two in the hepatic flexure.

3. *The absence of the mesentery* over a great part of its course means a frequent occurrence of retroperitoneal wounds. These are difficult to find and are largely responsible for the heavy mortality. The partially covered portion of the small intestine—namely, the duodenum—has likewise a very large mortality.

4. *Proximity to bone.*—This leads to wounds of the cæcum, the two vertical colons, and the pelvic loop by spicules of bone; and, as has been pointed out, these injuries are apt to be overlooked because the perforations in the peritoneum are not conspicuous.

Infarction.—This type of injury is met with in the small intestine, but I think it is rather commoner in the large. The cæcum with the ileum and the descending and iliac colons have all been found in this state. Interference of the blood-supply also leads apparently to an ulceration of the mucous membrane, which comes on fairly quickly after receipt of the wound. Captain Dunn has collected several cases of this type of injury which he will publish in due course.

Escape of contents.—The large intestine is often laden, but the condition of the contents renders massive escape less frequent than it would otherwise be; but, take it all in all, the escape from the large intestine is more frequent than that from the small, especially when the cæcum and ascending colon are involved.

Nature of the lesions.—Cæcum.—There have been a fair number of cæcal wounds; most of them have been small in extent and have lent themselves to suture. In other cases the wounds have been so big as to necessitate an artificial anus. In one case there was bruising of a transposed cæcum. In a good many cases there was a large retroperitoneal hæmorrhage; and it may be here recalled that this injury was in one instance accompanied by acute dilatation of stomach.

Transverse colon.—All kinds of wounds are met with here, from a simple single lesion to complete division. True antero-posterior wounds are not very common, and as a rule the transverse colon is struck obliquely, the bullet passing through the anterior part of the lumen. It has already been stated that such wounds are accompanied by lesions of the stomach and small intestine.

The posterior surface is sometimes wounded, and this may be overlooked unless it is borne in mind that such an injury is possible, for it is not obvious unless a special search is made. Bleeding from the vessels supplying the bowel is fairly frequent.

Vertical colons—i.e., the ascending and descending colon.—It is convenient to take these two portions together, as they have no mesentery. Both, especially the descending, lie rather further from the lateral line than would appear. The wound may be completely intra- or extra-peritoneal, or both combined. The actual lesions are perforations, slits, tears, or complete divisions. Perforations are most commonly met with in side-to-side wounds and complete division in antero-posterior wounds. All varieties are complicated with small gut injuries. Makins noticed that ascending colon wounds were more common at the base than other colon wounds, and he attributed the rarity of the descending colon wound compared with that of the ascending to the former being more often accompanied by small-gut injuries owing to the fact that the small gut overlies it. This partially explains the discrepancy, but the ascending colon is actually wounded more often than the descending. The possible explanation may be that the descending colon lies so far back that any bullet passing transversely and involving it and the small intestine would traverse a transverse plane situated so far back in the body as to involve the spine and great vessels. Of course, an antero-posterior wound would involve both the small and large intestine here, but these are not so common as the side wounds. The anterior wounds of the vertical colons are comparatively easy to find and to deal with if a suitable incision is used. The extraperitoneal are very difficult, and most probably are more often missed than any other. They may be small and valvular, and escape notice because they lie in a mass of areolar tissue, and this difficulty is very greatly increased when this tissue is infiltrated with blood, as it so often is. The great danger is an infection of the areolar tissue, and to this class of infection Fraser has given the apt term "colon septicæmia." I have seen it prove fatal within 12 hours, and that with an open wound.

Hepatic flexure.—Next to the transverse colon, the hepatic flexure is the easiest of all to deal with, as it lies fairly superficially. Its form leads to multiple injuries.

Splenic flexure.—This, from its position, is the hardest of all the large intestines to deal with, and even with the best placed incision it is difficult properly to examine without mobilisation.

Pelvic colon.—This portion of the large intestine is anatomically more like the small intestine than any other part of the colon and the lesions are somewhat similar. There are slits, perforations, or complete division, and these are often complicated with multiple small-gut and bladder injuries. Fracture of the pelvis, so often associated, increases the gravity of the case. I have been struck with the great variations in position as shown by the different situations of the wounds of the gut in different cases in which the bullet has taken a similar direction. The infectivity of its contents is very great, and an insignificant wound, even if got early, has proved fatal.

Symptoms.—The symptoms of intraperitoneal wounds are similar to those of the small intestine. A great difference lies in the behaviour of the extraperitoneal wounds; all grades of infection are met with. Sometimes we have cases of acute sepsis with or without gas formation which are fatal in a few hours; such cases are often past help when they arrive. They are cold, blanched and clammy, and the pulse running—in fact, their appearance often suggests acute hæmorrhage. The dangerous sepsis, shown by high mortality, accompanying artificial ani when formed in the vertical colons has led some operators to always make an attempt to close the wound. Unfortunately the damage is often already done when the case has come under treatment. In other cases, especially in antero-posterior wounds, or cases with a single wound in the loin, the symptoms are less acute. Some such cases arriving late and left may do well at first; then the usual signs of intoxication and local tenderness appear. In such cases an incision opening up the wound causes an

[1] Lectures I. and II. were published in THE LANCET, April 14th and 21st, 1917, respectively.

amelioration; a certain number of such cases appear not to be cases of colon infection but due to infected material carried in with the projectile.

Prognosis.—Figures seem to show that there is no great difference between the small gut and the large gut in the operated series of cases, though one must remember that in unoperated cases the small intestine is much more fatal, and one can say that small gut injuries are largely fatal from hæmorrhage and shock, while the great gut injuries are fatal from sepsis, especially retroperitoneal sepsis. This difference, of course, is due to the greater toxicity in the large intestine, which is known to all. It is possible that operative treatment may cause the death in a certain number of colon wounds which might have got well under the old conditions, but with the increased use of a transverse incision for the exploration of such wounds the dangers ought to be greatly reduced.

It is interesting to compare two series of figures. In 310 cases of penetrating wounds of the abdomen under operative treatment at the front the small gut mortality was 63·8, that of the great gut 60.

Makins's figures, which refer to cases at the base in the pre-operative days, show the mortality to have been as follows: Large gut mortality 38·7, small gut mortality 86 per cent. One must remember here, of course, that there was a great elimination of both classes of case.

Very few cases, apparently, of transverse colon wounds used formerly to reach the base, and this was attributed to its position favouring the spread of sepsis, but I am inclined to think that it was not so much this as to its frequent association with small gut injuries. The reason for the vertical colon cases reaching the base seems to have been an anatomical one, for those colons are tucked away at the side of the body and their situation is very favourable for sealing off a local infective area.

I have not been able to trace, so far, any great disparity as regards danger in the different portions of the large intestine.

Treatment.—In spite of the fact that some colon cases did arrive at the base and recover, I do not think that there are any surgeons who have had experience at operating who would advise abstention on this ground except in cases which arrive late.

Incision.—It may still be necessary to use a paramedian incision for a general exploration of the abdomen for the exclusion of, or for dealing with, other injuries. The transverse and pelvic colons are best dealt with from such an incision, as these lesions are commonly associated with those of the small gut. It may be necessary in certain cases to supplement this median incision with one towards the side of the body. When the projectile has traversed only one side of the body the horizontal loin incision is by far the best, and here again the value of an X ray examination in cases of single entry wounds is to be insisted on. The rectus sheath may be preferred by some for exploration of the hepatic and splenic flexures, but the association of kidney injuries with these wounds makes a horizontal incision more desirable, as the kidney can be dealt with in the posterior extremity of the wound, whereas an attempt to remove the kidney through the anterior incision is not very convenient or desirable. Open wounds involving the loin, and possibly involving the colons, can be dealt with by local enlargement, but in the absence of X rays a median incision to exclude other injuries is most probably desirable.

The local lesion.—The question of treatment is determined by the nature of the lesion. Suture should be attempted whenever possible, but a colostomy is often necessary to save time when other lesions have already been dealt with. If suture is employed in the uncovered parts of the colon adequate drainage must be established.

Proximal colostomy.—I thought when starting work that proximal colostomies would have a much wider application than I have found to be the case. They are, of course, useful in limiting the amount of septic absorption in cases of large wounds of the vertical colons, but, as has been pointed out, this tissue is already infected at the time the case has come under treatment; and, in addition, one does not feel inclined to make an extra opening in the bowel, and proximal colostomy to be of any use must be complete and must probably find its best application in these cases of loin wounds on the left side in which sepsis develops late, and in some wounds of the rectum. A cæcostomy is a perfectly useless procedure.

Rectal Wounds.

These may be either extra- or intra-peritoneal or both.

(*a*) The extraperitoneal ones are often accompanied by wounds of the buttock and fractures of the sacrum. The latter are especially dangerous, as sepsis spreads rapidly in the retro-rectal areolar tissue. The treatment is a free external opening and possibly a proximal colostomy.

(*b*) Intraperitoneal wounds are best treated by suture. In those cases where this is impossible it may be worth while closing the bottom of Douglas's pouch above the lesion and introduce a tube through the anus into the space thus shut off. The question of a proximal colostomy must also be considered.

Liver.

Frequency.—Out of 965 cases the liver was wounded 163 times. Liver wounds furnish a large proportion of the cases in which no operation was performed.

Organs wounded with it.—The stomach, colon, small intestine, and right kidney are those usually wounded with the liver. The pleuræ are often involved. The liver is often found wounded in cases of an exploratory cœliotomy where the entrance wound is far away. Many cases where the liver is obviously wounded are only submitted to operation to exclude the wounds of other organs.

Nature of injuries.—A good many cases of rupture by horse kicks have been seen, but most of the wounds are caused by projectiles or by ribs driven in by the missile. Makins says that transverse wounds were the most common at the base. The wounds are of all types, a simple perforation, an avulsion of fragments, especially of the anterior edge, to an almost complete disruption.

The wounds are usually commensurate to the size of the projectile: thus bullets, small shell and bomb fragments make perforations or scores; larger shell fragments more ragged wounds. Its friable nature, as would be supposed, lends itself to tearing and fragmentation; thus there may be radiating fissures from a central hole, crater-like exits, or pieces nearly or completely torn off. In some cases a bullet produces extensive destruction. These are said to be caused by short-range wounds, but of this I am not convinced. The track or torn surface is at first ragged and bloody; seen after 12 or 24 hours it becomes a dirty yellow brown, and later it may be a vivid yellow colour due to bilious staining. The injury, to judge from the microscopic sections, is usually limited to the vicinity of the wound, and in those cases where destruction of cells is found at some distance from the wound it is most probably due to an infarction phenomenon. Anyhow these infarcted areas are by no means uncommon.

Hæmorrhage varies; it is not altogether commensurate to the size of the injury and its amount largely depends on whether a big vein has been opened or not—if not, bleeding usually ceases spontaneously in from six to ten hours. The gall-bladder, common and cystic ducts have all been wounded, but the larger bile passages do not seem to be so often wounded as one might expect. Sometimes in the abdomino-thoracic wounds the bile escapes into the pleura.

Symptoms.—The symptoms are often slight and one has no doubt in deciding that the right course is the "expectant" one. Sometimes the symptoms seem surprisingly severe, and I can recall two cases of tangential wounds of the liver which could not have involved the liver deeply and in which there was no sign of blood in the abdomen. Both cases were extremely shocked and one ended fatally; unfortunately there was no post-mortem. There are the usual signs of abdominal injury, the main ones being those of hæmorrhage which manifested itself in the usual way.

Jaundice.—Jaundice of a slight and evanescent character, accompanied by bile in the urine in some cases, is seen in the early stages; it is of no great importance and usually passes off; its cause is not known. The septic form of jaundice which is seen at the base in a considerable number of cases, and which not infrequently ends fatally, is also seen at the front within three or four days of the receipt of the wound. There has also been one case of severe biliary peritonitis which ended fatally 36 hours after receipt of the wound. There was much bile in the peritoneum, and no other injury to account for the peritonitis. Of course, it is impossible to deny that infection may have been carried in with the projectile. I quote this case because there is considerable difference of opinion as to whether bile can cause peritonitis. In the pleura, apparently, it is often quite innocuous.

For the late facts of liver wounds I cannot do better than refer you to Sir George Makins's paper on this subject which appeared in the *British Journal of Surgery* (No. 12, iii., 1916).

Prognosis.—This may be said to be good. Thus we have 114 cases and 38 deaths. Shock and hæmorrhage are the common causes of death. In uninfected wounds mortality has a distinct relation to the amount of injury, both on account of the amount of blood lost and of the amount of injured substance. No connexion has been traced between the direction of the projectile and the fatality. Injuries of the big bile passages do not seem to increase the gravity to any appreciable extent. Attention has already been drawn to the grave symptoms of apparently trivial injuries.

Treatment.—Many cases require no operation, as there are obviously no other organs wounded. Many cases are operated on because of the possibility of injury to other organs and the bleeding in the liver wound found to have ceased.

The incision for an obvious liver wound is either an "*f*" shaped rectus incision or a sub-costal. A French surgery recently brought out recommends an incision parallel to the costal margin which passes through the costal cartilages. Access to the dome of the liver is said to be greatly facilitated by this method. The actual treatment of the wound when found consists in leaving it alone, packing it, or suturing. The latter is not very satisfactory. The big bile-passages can be dealt with on ordinary lines by suture and drainage.

Pancreas.

Frequency.—Very few of such injuries come under review—so few as to suggest that most of them are rapidly fatal. The association of the gland with the big vessels need hardly be mentioned.

Symptoms.—There are no distinctive symptoms, the lesion being found at explorations and accompanied by fat necrosis. The wasting so often seen in civil injuries and the formation of Jordan Lloyd's cysts have not been seen.

Prognosis.—One case was sent to the base in which the pancreas was obviously perforated by a bullet; the other cases were fatal. Makins has published some cases of wounds of this organ which he had seen at the base. He says that they were discovered during the performance of operations for intestinal injuries and that the typical results of the escape of the pancreatic juice have been observed. They have usually proved fatal. He mentions one interesting case in which an abscess formed and opened, in which the patient eventually recovered and was discharged to England. This man walked six miles after receiving his wound and suffered no abdominal pain. He had been retained some time at the casualty clearing station on the suspicion of an injury to the alimentary canal.

Spleen.

Frequency.—Wounded 54 times in 965 abdominal operations.

Associated injuries.—The kidney is most frequently injured with this organ; the splenic flexure is fairly frequently associated with it. The curious absence of combined stomach and spleen wounds has already been noticed. The thorax is often involved, though usually only at its inferior limit.

Nature of injuries.—These consist of perforations, tears, slits, avulsion of the upper and lower poles, and complete disruption. It is often injured by broken ribs, and rupture through an intact diaphragm has been described, the wound being produced in one case by a piece of hard clay.

Symptoms.—These are mainly those of hæmorrhage, and the diagnosis is made on these and on the position of the wound. Very often it is only found wounded in the course of an exploratory operation. There is nothing special about the hæmorrhage, and the damming up of blood in the left loin which has been said to be a feature of this injury in civil practice has not been conspicuous in the present campaign. The amount of hæmorrhage varies very much and depends mainly upon whether the vessels are injured. Unless this is the case, the hæmorrhage has usually ceased when the abdomen is opened.

Prognosis.—This is good unless the other organs are injured, or the main vessels of the organ torn. Experience at the base obtained by post-mortems on cases fatal from other reasons has shown the healing of many spleen injuries. The loss of the organ does not seem to cause any great shock. There must be many cases of soldiers in England without their spleen who offer a good opportunity for confirming the results on the blood produced by loss of this organ. I should be much obliged if any of those who come across such cases could let me have the result of the blood examination.

Treatment.—In uncomplicated wounds a subcostal or a rectus sheath incision with a transverse extension is most suitable. The kidney is very likely to be wounded, and has been removed in several cases with the spleen. If the hæmorrhage has ceased, the organ is best left alone; the suturing or packing will control the hæmorrhage if this is going on. As a matter of fact, sutured holes are apt to bleed almost as much as a raw surface unless the hæmorrhage is fairly free. Excision should only be resorted to if the organ is totally disrupted or the vessels torn.

One point has to be borne in mind in operating on those cases, especially if associated with wounds of the kidney vessels. The hæmorrhage, which very likely has been controlled or diminished by the clotting, is likely to restart in an alarming manner directly the clot is disturbed. It is therefore absolutely necessary to have everything ready for the arrest of the hæmorrhage.

Mortality and causes of death.—Shock and hæmorrhage are the main causes of death. One curious case may be quoted, that of a simple perforation of the spleen that died suddenly without cause on the fifth day.

Kidney.

Frequency.—The kidney was wounded 73 times out of 965 peritoneal operations. I have seen two cases in which both kidneys were injured; both were fatal.

Associated organs.—The spleen, liver, and colon are the organs most frequently associated, and, curiously enough, the spleen and right kidney have been wounded without other injury than perforation of the vertebra, which in this case was unaccompanied by paraplegia. The case was fatal from a late recurring hæmorrhage in the spleen. The right kidney is commonly associated with injuries of the liver and hepatic flexure and the left with injuries of the splenic flexure and spleen.

Nature of lesions.—The nature of the projectile has no particular effect on the injury, and, as is the case with other solid organs, the kidney is liable to extensive rupture. The actual lesions may be perforations, scores, furrows, avulsion of poles, and hemisection; sometimes the kidney is found lying loose, the pedicle having been ruptured. Sometimes the pelvis is alone perforated; sometimes the vessels are completely divided, the ureter remaining intact. The amount of hæmorrhage depends largely upon whether a vessel has been injured or not; there is very often considerable perinephric hæmatoma. In contra-distinction to civil injuries intraperitoneal hæmorrhage is very frequent.

Symptoms.—The shock is not, as a rule, very great and depends largely on the amount of blood lost; and this, perhaps, is peculiar when one remembers the effect produced by the kidney blow in boxing. The dullness due to free fluid in the abdomen is more common than in civil injuries and manifests itself in the right or left side according to the organ injured. *Hæmaturia* is usually present, but it may not occur at once. The absence of this sign is due either to suppression, to the presence of clots or to pieces of kidney in the ureter. Profuse hæmorrhage into the bladder is not common in the early stages. Hæmaturia usually clears up in a few days, but may persist. *Extravasation of urine* is not marked unless the pelvis has alone been injured.

Secondary complications.—A secondary hæmorrhage is a fairly frequent late complication, and occurs apparently most frequently during the second and third week after injury. The urine is generally contaminated. Sometimes the secondary hæmorrhage starts afresh, or it may manifest itself as an exacerbation of a persistent primary hæmorrhage. Unlike primary hæmorrhage, it is often accompanied with clotting of the blood in the bladder. Gas infection of an effusion of blood round the organ has been met with.

Treatment.—Many cases require no operative treatment. Sometimes it is advisable to open up the loin wound. Many cases of kidney injury are found after an exploratory cœliotomy complicating other visceral injuries. If the kidney is found to be not much damaged all that is necessary is a puncture drained into the loin; if much damaged nephrectomy may be necessary.

As was stated in talking of splenic injuries, the hæmorrhage from wounded kidney vessels is very liable to restart with alarming rapidity directly the clots are disturbed; and it is rather interesting here to mention that the number of

kidney wounds treated seems to be larger at an advanced operating centre than in the casualty clearing station. This is most probably due to the fact that the cases arriving earlier have not suffered so much from hæmorrhage. The treatment of secondary hæmorrhage is ablation of the organ, care being taken at the same time that the bladder is empty of clots.

Mortality and causes of death.—Shock and hæmorrhage are by far the most common at the front.

Ureter.

This is not very frequently injured, and the cases that we have had have done well. There are no particular symptoms and the injuries are found during explorations. Treatment follows civil lines.

Bladder.

My own opinion has undergone a change, and I now think that these injuries are more dangerous than I did after a few months' experience at the front, and I believe that the danger is an inherent one and apart from the complications to other injured organs. The bladder was wounded 45 times in 965 operated cases. In 25 cases it was the only organ injured.

Associated injuries.—The small intestine and fractured pelvis.

Nature of injuries.—They may be either intra- or extra-peritoneal, or both. The intraperitoneal lesions—perforations, tears, or slits—are very often not extensive. The extraperitoneal wounds, often accompanied by much hæmatoma, are slits or tears. They are usually situated at the sides of the bladder and may be often caused by bony spicules. The intra- and extra-peritoneal are usually caused by oblique wounds entering by the lower lateral part of the bladder and passing out through the peritoneal surface. Projectiles sometimes lodge within the bladder and cause pain at a later period.

Treatment.—Intraperitoneal wounds are, as a rule, easily sutured, except those which occur at the very bottom of Douglas's pouch. The bladder should be explored for a foreign body. A suprapubic drainage is not here necessary. Catheterisation for a few days may be necessary or a catheter may be tied in, although this treatment is not to be continued for long.

Extraperitoneal wounds.—These are treated by an incision down to the wound in the bladder, which latter may be sutured, if possible, and a drain left in the space formed by the opefation. If the wound in the bladder cannot be sutured it is most probable that a drain down to the wound will be sufficient; if there is any doubt a tube placed in the organ is most probably the safest course.

Colonel A. Fullerton, who has had much experience of these cases at the base, does not think that a suprapubic cystostomy is necessary in extraperitoneal wounds, as he has often seen cases at the bases do well discharging urine through the various fistula tracks caused by the projectile's entrance through the buttocks or upper thigh. He states, and justly, that urine is an aseptic fluid, and therefore need not be feared. It is quite true that many such wounds may reach the base, but at the front one sees cases wounded extraperitoneally do badly and show signs of septic intoxication; and when one has seen such cases do badly one does not feel inclined to hold one's hand.

Mortality and causes of death.—Uncomplicated cases have a mortality of 56 per cent. The causes of death are shock and hæmorrhage associated with fractured pelvis and, a few days later, sepsis.

Protrusion of Omentum and Viscera.

By this is meant, not the exposure of the abdominal contents through a large gap in the abdominal wall, but their prolapse through a wound very often comparatively small.

The omentum.—As would be expected, the omentum is most frequently seen in this connexion. It appears in larger or smaller amounts in wounds situated all over the abdomen and also in those situated in both hypochondriac regions, where it reaches the outside of the body through the interspaces or through broken ribs where one hardly would expect to see it appear. The method of extrusion is two-fold: it is either (1) carried out by the projectile, or (2) is driven out by the intra-abdominal pressure either through the entrance or exit wounds.

In one case where a shell fragment had entered above the umbilicus in the mid-line and had come out in the right loin behind the lateral line of the body, the omentum was so firmly carried into the long oblique exit wound that it required considerable force to release it; it was, in fact, strangulated within the abdominal wall, though none of it showed externally.

Before operation became the rule it was usual to leave these tags to slough off, and probably this is still the best course to pursue if the cases are seen late. If seen early it is best to treat such cases as other abdominal wounds and explore. In several instances in which this had been done the intestine has been found wounded.

The stomach.—This has been found herniated by itself or in association with the spleen, splenic flexure, and small intestine. In one case it was successfully sutured and replaced, though too much of the abdominal wall had been carried away to allow the external openings to be closed.

Liver.—This organ has also been partly herniated.

Small intestine.—Next to the omentum the small gut is most frequently herniated; and here again, as in the case of the omentum, it may be carried out or expelled. Sometimes a knuckle lying outside has been actually wounded, in other cases the extruded knuckle has been intact, but there have been numerous lesions within the abdomen.

If seen early the ordinary rules apply, and the abdomen should be opened and the lesions repaired; if seen later—over 24 hours—it is not probable that anything can be done, but still it is better perhaps to explore if the condition of the patient justifies it.

Colon.—The transverse colon has been herniated. In one case the gut was tightly herniated in the wound and, as the injury was two days old, the constriction was relieved and an artificial anus established.

ANÆSTHETICS FOR MEN WITH WOUNDS OF THE ABDOMEN.

BY CAPTAIN GEOFFREY MARSHALL, R.A.M.C.

A patient with a penetrating wound of the abdomen usually shows signs of shock. In a typical case the face is pale, the extremities cold, the pulse rapid, and the blood pressure below normal. If put to bed and surrounded with hot bottles the man's general condition will improve. Both surface temperature and blood pressure rise. It is important that heat-loss should be prevented during the course of operation.

The choice of anæsthetic.—Men who have been wounded less than 40 hours previously are not good subjects for spinal anæsthesia. Intrathecal injection of stovaine is followed by a great fall of blood pressure, which may be fatal. Men with wounds of the abdomen appear to be no exception to this rule. The writer's experience of spinal anæsthesia for these cases has been limited and unfortunate. Three patients were each given 0·07 gm. stovaine. They all died within a few hours of operation. Chloroform is an unsuitable anæsthetic. The blood pressure falls steadily during the course of the administration. If the operation is prolonged the patient may die before the abdomen is closed or during the next few hours.

Ether remains the drug most generally used. Good results have been obtained with open ether. Its chief disadvantages are: 1. The loss of body-heat caused by the prolonged inhalation of cold vapour. This is especially noticeable in the theatres of clearing stations which are commonly lodged in tents or temporary buildings difficult to keep really hot. 2. Irritation of the respiratory tract. This is most serious in winter, when many of the wounded have some bronchitis before operation. Men wounded in the abdomen are particularly liable to develop bronchitis. This may be due to deficient movement of the lower chest. At this clearing station the proportion of cases which had bronchitis after operation was 54 per cent. when open ether was used. With warm ether vapour the percentage dropped to 14·7. These figures were obtained from two comparable series of cases occurring in the same months of two successive years.

Ether should not be given by the intravenous method to men suffering from shock. In these cases profound collapse may occur within two hours of administration.

In our experience the most satisfactory way of administering ether or chloroform is by the Shipway apparatus.[2] The patient inhales a warmed mixture of air and anæsthetic vapour. Induction is quiet and rapid. The absence of struggling may save much bleeding from wounded vessels. Breathing is easy and noiseless. There is a remarkable absence of secretion. The patient recovers consciousness

[2] THE LANCET, 1916, i., 70.

quickly and vomiting is rare. It is usually possible to give fluids by mouth within two hours of operation. In lengthy operations it is an advantage to pass oxygen instead of air through the ether.

When the projectile has penetrated the chest as well as the abdomen ether should not be used. It is apt to provoke fatal intrathoracic hæmorrhage. In these cases we have found the most successful sequence to be a preliminary injection of hyoscine 1/100 gr., morphia 1/6 gr., and atropine 1/100 gr. This is followed by a minimal amount of warm chloroform vapour and oxygen.

It is not necessary to give atropine before a warm ether vapour anæsthetic. We have not found any advantage in doing so. In the majority of cases morphia should be withheld before operation, or given only in small doses. A man recently injured is particularly susceptible to further shock. This susceptibility is greatly increased by large doses of morphia.

Factors causing fall of blood pressure during abdominal operations.—During the course of an ether anæsthetic the blood pressure shows a tendency to rise. If there is much manipulation of gut and peritoneum, it will fall gradually. The process, however, may be continued for hours without the blood pressure falling to dangerous levels. Exposure of gut outside the abdominal cavity produces a much more serious effect. If more than two or three feet of gut are exposed the blood pressure will commence to fall after a few minutes. It will continue falling rapidly until the gut is replaced. This effect is seen when great omentum only is exposed. Surgeons should be urged to make big incisions, and work as much as possible with the gut lying inside the peritoneal cavity.

Apart from copious hæmorrhage, there is one other procedure which causes rapid fall of blood pressure. This is turning the patient on his side. The effect is only produced if the patient has been under the anæsthetic for a considerable time before being turned. At the end of an abdominal operation the patient may be in good condition. He is then turned on the right or left side so that the surgeon may excise a wound in the back. In a few minutes there is a great fall of blood pressure and the radial pulse disappears. It may be hours before the patient recovers this lost ground.

The indication is that wounds of the back should be dealt with before laparotomy. Turning the patient has no ill-effect in the first half hour of an ether anæsthesia.

CAUSES OF FAILURE.

It has been sufficiently indicated that the chief causes of failure are hæmorrhage, shock, and sepsis. Hæmorrhage and shock are the early causes, sepsis are later. The latter is of two kinds: (*a*) Peritonitis as the result of soiling the peritoneum with intestinal contents or that carried in by the missile; (*b*) the sepsis which occurs in colon wounds on the uncovered portion of the bowel. To these causes must be added two more.

Mental and physical strain.—It is commonly said that the surgeon in war has the advantage over his peace colleagues in that his subjects are healthy young adults. This, of course, is true, but still there is the strain caused by days of watching and alertness and of nights when sleep is difficult, interrupted, or impossible to obtain. Just before an action very likely both artillery and trench mortar bombardment increase to their maximum. Then there is the exertion of battle coming on the top of days of constant strain. The excitement of battle, for the time being at any rate, obliterates all sense of fatigue, so that many men do not know how tired they are until some wound is received which prevents them going farther. Then there is the journey, which we have already described, to the casualty clearing station. Sometimes the men arrive practically asleep and resent any interference or examination. Other men arrive in whom a state of excitement is still present, and they are willing and anxious to chatter about their experiences. Then, after being fed they are dressed, and if they do not fall asleep in the process, they do so immediately afterwards; and it is one of the most striking sides of the medical side of war to see a large room filled with men lying on stretchers—some slightly wounded, some severely, some mortally, but all asleep and asking for nothing but sleep. They are worn out body and soul. It is on such patients that the surgeon has to work, and it may well be imagined how much the mental and physical strain increases the shock of the injury.

Complicating injuries.—One need say very little on this subject except that every kind of bodily injury may be added to that of the abdomen. Compound depressed fracture of skull, fractured long bones, multiple wounds, fractured spine, and avulsed limbs are among such complicating injuries, and when one considers the total mortality and in appraising the worth of abdominal surgery one must take these injuries into account; it may be said that were it not for such extraneous injuries the mortality would be considerably lower. No attempt has been made in the operative table to show such injuries.

THE FUTURE.

It cannot be denied that the measure of success that has been obtained in abdominal surgery, and for the matter of that in other wounds, is principally due to the fixity of the battle-line. Can the high standard be kept up if the armies get on the move? The answer is doubtful. It largely depends on whether it will prove possible to render the casualty clearing station sufficiently mobile to prevent a large gap recurring between it and the field ambulance. We shall never be in the same condition as we were in Africa, as the motor ambulances have largely minimised distance, but the motors will never be able so to eliminate space as to make a casualty clearing station far back as useful as one well up.

The two most importance functions of a clearing station are: (1) To warm and feed men; (2) to operate upon them under reasonably favourable conditions. The cook-house and the theatre supply these conditions. Nursing and after-care are important, but it is better to operate on an abdomen and let a man lie on a stretcher than not to operate on him because beds and nurses are absent.

Shall we return to the expectant treatment if the war changes its character? I am inclined to think not. People have learnt that the abdomen is not such a fearful place, and that good results can be obtained without the elaborate surroundings that were formerly thought necessary. The peritoneum has ceased to be the bogey that it was.

RESULTS.

The table published with this lecture tells what has been accomplished. I would only add that every attempt has made to find out what could be done by surgery for the abdominally wounded. The mortality has been reduced at the front by some 10 per cent., and many fewer cases now die at the base. The period covered by these figures extends over 18 months, so that a fair average has been struck. The 18 months were mostly what is euphemistically called a quiet time, but included one period of strenuous fighting. It is interesting to note that the mortality over a period of 18 months is the same as that for the first six months of that time, which fact seems to show that the figures represent a true picture of what may be expected from operative treatment.

The main results may be summarised as follows:—

Total number of cases ...	1288	No operation considered advisable	73
Arrived moribund	250	Total operations	985
Total mortality, excluding moribund	50%	Total operative mortality	54%
Total mortality, including moribund	60%	Total hollow viscera mortality	65%
Considered with view to operation	1038	*Stomach mortality	53%
		*Small gut mortality	66%
		*Great gut mortality	56%

* Uncomplicated by wound of any other hollow alimentary viscus.

Table of Operations.

Operation.	To base.	Died	Operation.	To base.	Died
Suture of stomach ...	26 ...	29	Proximal colostomy ...	4 ...	10
Suture of stomach and other operations on intestinal tract	6 ...	21	Cœliotomy, no hollow viscus perforated ...	89 ...	33
Resection of small gut	28 ...	89	Cœliotomy, liver wounded	76 ...	38
Resection of small gut and other operation on intestinal tract ...	5 ...	34	Kidney, exploration of	25 ...	7
Suture of small gut ...	59 ...	71	Kidney, excision of ...	6 ...	7
Suture of small gut and other operations on intestinal tract ...	17 ...	33	For wounded bladder	11 ...	14
Small gut anus	— ...	7	Spleen, exploration of	12 ...	4
For small gut fistula...	2 ...	1	Spleen, excision of ...	4 ...	12
Suture of great gut ...	50 ...	52	Miscellaneous	10 ...	21
Great gut anus	13 ...	36	No operation advised	69 ...	4
For wounded rectum	3 ...	5	No operation, moribund	— ...	250
			Grand total	513	775

NOTE.—In the case of injury to hollow viscera there were wounds of the solid viscera which are not shown. Thus in the case of "suture of stomach," of 29 fatal cases 11 were complicated by wounds of the solid viscera.

ABDOMINAL SURGERY AT AN "ADVANCED OPERATING CENTRE."

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OUT of the 640 cases of severe injuries to the abdomen, head, or chest, received at this advanced operating station in six months 263 of them were wounds of the abdomen. Several records of abdominal work at the front have been published, but so important is this branch of surgery, and so different in many respects from abdominal work at home, that it is important that the experiences of those doing this work should be recorded.

The hospital is stationed close up to the line and is thoroughly equipped for dealing with urgent surgical work. The wounded are nursed by sisters with a staff of orderlies, and the permanent officers are a surgical specialist, an assistant, and an anæsthetist, constituting "a team." The time elapsing between the receiving of the wound and the admission to hospital depends on the time taken in getting the patient back to the advanced dressing station, from which he is sent direct to us. It is generally longer during an attack than in times of quiet.

As soon as the patients arrive they are taken to a receiving ward and placed in beds always kept ready warmed, where they are examined, the findings noted down, and the position of the wounds marked on diagram. These notes are subsequently transcribed into the Special Abdominal Book issued by the Committee of the Medical History of the War, and have added to them later the notes received from the base and from the home hospitals. Thus a complete history of the case is kept from the receipt of the wound until the time the man is finally discharged.

The patients remain in the receiving ward until they are taken to the theatre for operation, or, in those cases where an operation is definitely contra-indicated, to the wards. It is an important point in a hospital at the front not to send abdominal cases into the general ward for observation, as if this is done in a rush there is a danger of these cases being overlooked, and for the same reason patients in a seemingly moribund condition are not removed from the receiving ward, so that if their condition at any time improves they can immediately be sent to the theatre.

Question as to whether the Wound is Penetrating.

In dealing with abdominal cases the first question to be decided is whether the wound is penetrating or non-penetrating—that is to say, whether the missile has entered the peritoneal cavity causing visceral injury, or whether it is a "contour wound" involving only the abdominal wall. To help one to decide this question and in examining every patient with an abdominal wound the following points must be considered:—

1. *Facies.* This sign does not possess the same value as it does in abdominal conditions met with in civil practice. Most of the men brought in with severe wounds wear an anxious and worried mien.

2. *Pain.* This is always present in wounds of the gut. It is also present in retroperitoneal hæmorrhage with its consequent stripping off of the peritoneum from the tissues; it is especially severe when it takes place on the posterior surface of the abdomen; of course, pain is very much modified by the amount of morphia that has been given.

3. *The pulse* is small in volume but varies greatly in frequency and may be comparatively slow. In the series of 110 cases on which laparotomy was performed it was under 100 in 64. Any irregularity of the pulse is a bad sign.

It is very noticeable at the front how small, owing to the contraction of the arteries, the pulse may be in limbs which have been exposed to the cold. One patient who was admitted with a mere superficial wound had an almost imperceptible pulse at the wrist, whereas the pulse in more protected parts of the body (e.g., dorsalis pedis) was quite good in both volume and tension. The arms had been exposed outside the blanket on a cold day during the journey to the hospital.

4. *Vomiting*, if present, is a sign of peritoneal irritation. In cases of stomach wounds it nearly always occurs, with or without hæmorrhage. Its importance is modified by the fact that a large number of those who are wounded in other parts of the body are liable to be sick.

5. *Abdominal rigidity* is widespread and continuous in cases of injury to the hollow viscera. It is not so marked in cases of excessive hæmorrhage, and it tends to pass off in the last stages just preceding death. Abdominal rigidity also occurs in wounds of the lower chest, but in these cases, if the hand is laid on the abdominal wall, the muscles will be found occasionally to relax and an incomplete respiration taken. More localised rigidity is produced by a contour wound or hæmorrhage associated with it. Rigidity that is due to a chest wound is found to relax if the patient's shoulders be well raised and a pillow be placed under the knees.

6. *Tenderness* is perhaps the most important sign of penetration of the abdominal cavity with injury to the gut. It is not usually limited to the area of the wounded gut, but is more generalised. It is not so marked in cases of injury to the solid viscera.

7. *Hæmorrhage.*—In most penetrating wounds one gets some internal hæmorrhage, which shows itself by dullness in the flanks and hypochondrium. In very rare cases hæmorrhage may be present in the peritoneal cavity without any breach of the peritoneal surface.

8. *Liver dullness.*—The presence or absence of liver dullness cannot be relied on. It has often been noticed to be absent in cases where there has been no injury to gut, and free air in the peritoneal cavity is scarcely ever met with even in wounds of the stomach. At an operation the stomach may be seen distended with gas which has not escaped, though there is a penetrating wound in its wall. It is interesting to note that liver dullness is often absent in moribund cases. Out of a series of nine such cases seen in sequence the liver dullness was absent in seven. The explanation of this probably is (*a*) that shrinkage of the liver has occurred from excessive bleeding. A small contracted liver is almost invariably met with in operating on cases where there has been much bleeding into the peritoneum. (*b*) That there is a paralytic distension of the gut.

9. *Position of wound of entry.*—It should be noted that nearly all of our cases were examples of wounds by bombs and shells, many of which necessarily burst upon the ground and just as frequently behind or beside the patient as in front of him. This is probably the explanation of the fact that a considerable majority of our patients were wounded behind a line drawn from the anterior fold of the axilla to the anterior superior iliac spine. In no less than 23 out of the series of laparotomies and also in several of those who were admitted in a moribund condition, the missile had penetrated through the buttock, and therefore when wounds are received in this region the possibility of the foreign body having entered the abdomen must never be overlooked. In wounds of the back, with damage of the structures lying beneath the peritoneum, symptoms are often produced which simulate those found in penetration of the abdomen. This is exemplified by the following case:—

Private B. was admitted on Nov. 13th with a wound to the outer side of the left erector spinæ muscle and the second lumbar vertebra. On examination of his belly it was found that he had dullness, pain and tenderness on the left side of the abdomen. He was rigid, but the rigidity was confined to the left half, and it was mainly this latter fact which made us conclude there was no penetration of the abdominal cavity, but that it was a case of retroperitoneal hæmorrhage.

A second case exemplifying the same association of symptoms was the following:—

Private H. admitted Oct. 16th, 1916, complained of great pain in the right half of the abdomen; he was very tender in this region, and had some dullness over the lower abdomen. The wound of entrance was on the inner side of the left gluteal fold and these signs and symptoms were produced by the missile having passed upwards and forwards into the right abdominal wall and having caused a large extra-peritoneal hæmorrhage with bleeding from the deep epigastric artery. In this case so closely did the signs and symptoms simulate those of a penetrated gut that exploratory laparotomy was performed. Enough importance had not been attached to the fact that the rigidity was confined to the right side of the abdomen. It has been pointed out above that the rigidity is almost always general in wounds of the gut.

When the wound is received higher up, at or near the costal margin, the case may be complicated by damage to the pleural cavity or liver. These cases will be considered at a later period.

The size of the wound of entry may be some indication of the damage received internally, and a useful working rule is this: A large wound with few abdominal symptoms suggests the probability of little or no damage internally; whereas a small wound with well-defined abdominal symptoms is a clear indication of a lesion of the abdominal contents. In doubtful cases exploration under an anæsthetic may be

necessary, the direction and depth of the wounds can then be ascertained and an exploratory laparotomy incision be made. In our experience the question of penetration of the abdominal cavity was only in doubt in 1 per cent. of the total cases.

Choice of Cases for Operation.

No hard-and-fast rule can be laid down in hours as to when a case passes from the operable to the inoperable stage. When cases arrive within 24 hours of being wounded, so long as they are not moribund, they are all operated on. If cases arrive later than 24 hours more careful discrimination is necessary. If both wounds are in the region of the flanks, and the probabilities are that the lumbar colon only is opened, they may sometimes be left, and after a few days a fæcal fistula develops and they do well. We had three such cases and these all had an exit wound, so that the course of the missile was known. If they arrive with wounds involving the abdomen, loin, or buttock, with obvious penetration, and they are not moribund, it is best to operate at once, as the fact that they have survived 24 hours shows that they may not have very serious injuries. If left they will almost certainly die.

The following is an analysis of the time that elapsed between the receipt of the wound and the operation, and shows how important early operation is:—

1. Cases operated on between 1 to 6 hours after wounding —43. Recovered, 27 = 62·8 per cent. Died, 16 = 37·2 per cent.

Eight of the fatal cases had such severe injuries that recovery was practically hopeless and they would not have survived to reach the operating theatre had they been brought in later.

2. Cases operated on between 6 to 12 hours after wounding —33. Recovered, 12 = 36·3 per cent. Died, 21 = 63·7 per cent.

3. Cases operated on between 12 to 16 hours after wounding—18. Recovered, 3 = 16·6 per cent. Died, 15 = 83·4 per cent.

4. Cases operated on over 24 hours after being wounded—11. Recovered, 5 = 45·4 per cent. Died, 6 = 54·6 per cent.

Recoveries at 48, 36, 33½, 32, and 30 hours respectively. Deaths at 60, 36, 32, 30, 29, and 28 hours.

In the fourth class bowel injury was present in every case except one at 48 hours, and in this case the omentum was herniated through the skin and several coils of bowel through the muscles under the skin. It is interesting to note in this connexion that peritonitis in itself does not mean a bad prognosis, as it is found that where the peritoneum shows an early and marked reaction the cases often do well.

It has sometimes been suggested that operations should be postponed in order to allow shock to pass off, and we should strongly uphold this view in all other injuries except wounds involving the hollow viscera. In these cases, in our experience, the shock never does pass off. The soiling of the peritoneum must tend to keep up shock. The statement, that for the most part shock never passes off is borne out by the fact that of 36 cases admitted in an almost pulseless condition only three rallied; these were all cases where the liver only was wounded and all three recovered without operation. Bowel cases always steadily deteriorate by being left. Another reason for immediate operation is that internal hæmorrhage may be still taking place. These remarks are chiefly based on experience of shell wounds, bullet wounds being relatively uncommon here. The only delay which is justifiable is in cold weather and if the patient had been lying out for some time. In these cases it is essential that he be thoroughly warmed before his operation, but this should never take more than half an hour to an hour.

The next difficulty in the choice of case for operation is the decision in wounds of the solid viscera—e.g., liver and spleen—and the decision is rendered more difficult by the fact that in many of these cases the missile has passed through the pleural cavity before entering the abdomen. The track of the missile is estimated as accurately as possible, and if it is probable that the liver only is wounded no operation is performed unless there are signs of excessive internal hæmorrhage. We have notes of 11 cases of wounds of the liver treated on expectant lines; of these, 7 recovered and 4 died. Five developed pus in or around the liver, and 3 succumbed to this sequela. Twenty-one cases of wounds of the liver had to be opened up, and in 9 some hollow viscus was found to be wounded as well. From this it is clear that the majority of wounds of the liver must have an exploratory laparotomy performed. A button-hole incision is utterly useless owing to the large amount of blood in the peritoneal cavity. If the splenic region is involved, laparotomy is more frequently necessary as there is more likelihood of some hollow viscus being wounded. Hæmorrhage from the spleen is not usually dangerous unless the large vessels are injured.

In the series of 110 laparotomies one or other kidney was found to be wounded in 14. In every case this was in association with other injuries. In none of our series of 263 abdominal cases was operation necessary for the kidney condition alone, although damage to this organ was fairly frequently met with as shown by pain and hæmaturia.

The complication of the passage of the missile through the pleural cavity before entering the abdomen does not contra-indicate the performance of laparotomy. It was present in 18 of our series of laparotomies, 10 of which recovered. In the majority the solid viscera only were wounded, but in one successful case the bowel was injured as well; another bowel case died from the effects of hæmothorax. In only one case did the operation so aggravate the chest condition as greatly to contribute towards the fatal results. In these cases the anæsthetic of choice is chloroform, hypodermic injection of morphia and atropine having been previously given. It is not advisable to attempt to drain the wound of the liver through the pleural cavity, as of necessity this involves infecting the pleura. In all chest cases great care is taken to drain any hæmothorax that may be present as soon as it is found to have become septic. Occasionally in suitable cases we have tried sewing up the chest wound after excising its edges in order to prevent infection of the pleural cavity.

To show how capricious the course of a bullet may be, the following case is cited:—

Private E. was admitted 60 hours after being wounded. His wound of entry was on a level with the first lumbar spine and 7 cm. to the left of it; the shrapnel ball could be felt under the skin, lying on the sixth right chondro-sternal junction. His general condition was good; he had slight vomiting, hæmaturia, and dullness in the flanks. He had no operation and made an uninterrupted recovery. By a study of cross-sections we made out that the fragment had passed through the perirenal fat striking the cortex of the left kidney; it then skirted the upper border of the pancreas, traversed through the lesser sac of the peritoneum and the gastro-hepatic omentum above the lesser curvature of the stomach. It then pierced the liver and diaphragm, to come to rest on the sixth rib junction half an inch to the left of the right pleural reflection and immediately below the pericardium.

Moribund cases.—It is difficult to state the signs that are relied upon in forming an opinion that a case is hopeless. The term is justified by the fact that the average duration of life in 33 moribund cases admitted here was under five hours, in spite of everything that was done to try to rally them. In most of the cases the pulse was imperceptible or almost so, and in some cases where it could be felt it was irregular. Many of the cases were suffering from complicating wounds of limbs or head. As the general sensibility becomes more clouded tenderness and rigidity of the abdomen become less marked. If a case is seen to be hopeless an operation should not be performed, as should they survive the operation death in these cases is much more painful.

Another type of case in which operation should be avoided is that where the missile, with or without passage through the abdominal cavity, has lodged in the vertebral column and caused lesion of the spinal cord. Every case on admission is tested for paralysis of the lower extremities, even when the wound is in the mid-axillary line or on the point of the shoulder. In one rush of work we had seven spinal cases in two days, in most of which the spinal lesion was undiagnosed before admission. These spinal cases may have intense pain referred to the abdomen which might cause a mistaken diagnosis of a penetrating wound of the peritoneal cavity.

Treatment.

During a rush the order in which cases are sent to the theatre is of great importance. Gut injuries are sent first, then the cases of suspected wounds of the solid viscera, and lastly contour wounds. At these times one of us remains constantly in the receiving room, as the order of cases for operation may have to be changed from time to time as this or that patient develops fresh symptoms. As to the technique of the operation, little need be said.

SERIES OF 110 CASES OF LAPAROTOMY FOR WOUNDS OF THE ABDOMEN.

"Result" col.: R, recovered; D, died. "Vomiting," "Rigidity," "Tenderness" cols.: P, present; N, not present; P(h), present (hæmorrhage); P(ls), present (left side); P(rs), present (right side); NM, not marked; P(hy), present in hypogastrium; L, local.

No.	Result.	Hrs. after injury.	Pulse.	Vomiting.	Position of entry wound.	Rigidity.	Tenderness.	Injury found.	Complications.
1	R	4	88	—	Below and to left of umbilicus.	P	P	Three rents in upper part of jejunum. Bleeding from mesentery.	—
2	D	4½	84	P	Right chest behind.	P	P	Penetrating wound of right kidney. Two holes in small intestine.	Right hæmothorax.
3	D	7½	100	—	Right buttock.	P	P	Two holes in small intestine 14 in. above cæcum. Mesentery bleeding.	Iliac bone smashed.
4	D	3	109	P	,,	P	P	Many holes in small intestine. Three resections.	Wounds of upper & lower limbs.
5	D	14	80	P	Lower right chest.	P	P	Left kidney torn (nephrectomy). Spleen torn.	Three ribs broken. Old tubercle of lung.
6	R	5½	85	N	Transverse, sub-umbilical.	P	P	Abdominal wall opened from right to left flank. No injury to gut.	Injuries to left forearm.
7	R	7½	80	N	Below and to left of umbilicus.	P	P	Ten wounds in jejunum. Resection 20 in. Hole in meso-colon.	Fracture of left radius through-and-through wound.
8	D	6½	72	N	Right iliac region.	P	P	Wound of cæcum and transverse colon and ileum.	—
9	D	14	96	P	Left buttock.	P	P	Two holes small intestine. Hæmorrhage from intern. iliac.	—
10	D	11	120	N	Left loin.	P	P	Wound 3 in. long, 4 in. below duodeno-jejunal junction. Bruising of left kidney.	Much laceration of muscles of back.
11	D	12	88	P	Right rib margin in front.	—	—	Right lobe of liver almost torn in two. Much bruising of abdominal wall.	—
12	R	3½	92	N	Left chest.	P	P (ls)	Wound of and hæmorrhage from spleen.	Penetrating wound of chest.
13	D	—	112	—	Left rib margin; omentum prolapsed.	P	P	Two holes in transverse colon. Large rent in diaphragm through which stomach and transverse colon passed into left pleural cavity.	—
14	D	22	80	—	Right rib margin; omentum lacerated.	P	P	Lower margin of liver smashed. Three holes in small intestine.	—
15	R	33½	104	P	Left buttock.	P	P	Wound of spleen and wound of small intestine.	Peritonitis present.
16	D	14	120	N	Right buttock.	P	—	Wound of liver.	Retro-peritoneal hæmorrhage.
17	D	22	108	P	Right loin.	P	—	Wound of right kidney, liver, and diaphragm.	Right chest penetrated.
18	R	30	132	P	Left buttock.	P	P	Wounds in cæcum and 8 or 9 holes in lower part of small intestine. Resection 12 inches.	Peritonitis present.
19	R	48	88	N	Over left great trochanter.	P (ls)	P	Muscles of abdominal wall torn through, on left side omentum injured.	Iliac bone fractured.
20	D	15	—	P (h)	Below and to left of umbilicus.	P	P	Twelve holes in small intestine. One large hole in transverse colon, and two holes in stomach.	Peritonitis.
21	R	6	100	—	Left 12th rib behind	P	—	Left kidney penetrated. Spleen torn (sewn with catgut).	Lower three ribs smashed.
22	R	11	128 (vf)	P	Below and to left of umbilicus.	P	P	Eight holes in jejunum (upper part); three wounds in great omentum.	Wounds left thigh and right arm.
23	D	11	115	—	Right buttock.	NM	P	Seven holes in small intestine. Appendix torn away.	Wound of right leg. Fractured right pelvis.
24	D	17	148	NM	Right flank.	NM	P	Wound in ascending colon. Wound of right kidney.	Retroperitoneal hæmorrhage (extensive).
25	R	6½	100	P	Mid-line below umbilicus.	P	P	Five wounds in small intestine, one almost dividing gut. Three holes in mesentery.	Wound of face.
26	D	7	106	P	Left buttock.	P	P	One wound in small intestine. Two wounds in descending colon.	Wound of right calf. Fractured ilium.
27	R	3½	92	N	Right costal margin	P (rs)	P	Deep tear in right lobe of liver.	Wound in back.
28	D	3½	100	P (h)	Right chest.	P	—	Penetrating wound of liver. Tear 3 in. long in stomach. One hole in small curvature. One hole in small intestine.	Penetration of right chest.
29	D	12½	100	P	Right buttock.	P	P	Wound in small intestine.	Peritonitis. Wound of rt arm.
30	R	5	90	—	Right epigastric.	N	P	Missile passed down cutting through abdominal muscles, bruising anterior wall of bladder, and dividing urethra. No injury to gut.	Large pelvic hæmatoma.
31	D	6½	80	N	Left loin.	P	P	Spleen torn and bleeding, removed. Kidney torn and bleeding, removed.	—
32	R	5	92	N	Epigastrium.	NM	NM	Through-and-through wound of right lobe of liver. Much bleeding. No injury to gut.	—
33	R	15½	98	N	Left iliac.	P	P	Hæmorrhage from mesocolon.	Retroperitoneal hæmatoma.
34	D	17½	128	N	Left flank.	P	P	Tear in splenic flexure. Left kidney torn.	Left thumb blown off. Wound of scalp.
35	D	6½	--	N	,,	P	P	Four holes upper part of jejunum. Two holes transverse colon.	Excessive retroperitoneal hæmorrhage.
36	D	16	98	N	Right chest.	P	P	Four holes in small gut. Tear of great omentum.	Seven wounds of right leg.
37	D	16	64	P	Right flank.	P	P	Eight holes in small intestine. Resection. Three holes in colon. Right lobe of liver torn.	—
38	D	29	110	—	Right lower chest.	P	P	Wound in diaphragm, liver, and omentum.	Right chest wound.
39	D	28	—	N	Left of umbilicus.	P	P	Two holes in jejunum, one tear in transverse colon.	General peritonitis.
40	D	34	112	P	Left flank.	P	P	Four tears in small intestine. Resection.	—
41	R	36	94	P	Right of umbilicus	P	P	Wound small intestine. Hæmatoma in omentum.	Peritonitis present. Fractured left iliac bone.
42	D	30	98	—	Right epigastrium.	P	P	Many holes in small intestine. (28 in. resection.) Hole in ascending colon.	Gas gangrene in mesocolon.
43	D	36	106	N	Left flank.	P	P	Hole in colon, stomach, and small intestine.	Gas gangrene in left thigh.
44	D	60	124	N	Epigastrium.	P	—	Tear in ascending colon.	Right iliac bone fractured. Wound of right leg.
45	R	32	100	P	Left of umbilicus.	P	P	Two holes in jejunum. Tear in transverse colon.	General peritonitis. Bronchitis.
46	D	5	96	N	Right buttock.	P	P	Three tears in small gut. Two holes in rectum.	Died under stovaine anæsthesia.
47	R	8	106	P	Left buttock.	P	—	Two holes in colon. One tear in small intestine.	General peritonitis present. Compound fracture of left tibia. Fracture of left iliac bone.
48	D	6½	100	—	Left rib margin.	P	P	Jejunum torn across. Resection. Hole in transverse colon. Sigmoid torn across.	Left kidney lacerated.
49	R	11	82	P	Left iliac region.	P	P	Hole in jejunum. Hæmorrhage into mesentery.	—
50	R	12½	124	N	Left thigh.	P	P	Several holes in cæcum. Appendix inflamed.	Penetrated left iliac bone.
51	D	5½	100	—	Right epigastric.	P	—	Four inch rent in duodenum.	Retro-peritoneal tissues opened up.
52	R	5	128	—	Left iliac region.	P (hy)	—	Two holes in bladder, two in rectum, missile leaving body through left buttock.	—
53	D	6	136	N	—	P	P	Many holes in small intestine. (Resection.) Many holes in colon. Colectomy. Ileum implanted in sigmoid.	—
54	R	5½	86	P	Lt. chest; omentum & sm. int. prolapsed.	P	—	Four feet of small intestine cleaned and replaced. Spleen lacerated and bleeding. Splenectomy.	Left chest opened. Empyema subsequently drained.
55	D	—	90	P	Left buttock.	P	P	Much hæmorrhage into peritoneum. No lesion of gut found. Wound of left kidney passing up through diaphragm to left lung.	Multiple wounds of leg.
56	R	12½	100	—	Left epigastric.	P	—	Stellate tear in left lobe liver. Much hæmorrhage. Sewn up.	—
57	R	5½	96	N	Left lower chest.	—	—	Hole in small intestine. Lacerated wound of splenic flexure of colon. Resection. Omentum herniated.	Subsequent pneumonia.
58	D	5½	108	P	—	P	P	Transverse colon. Six separate holes closed. Many holes in higher up. (Resected.)	—

SERIES OF 110 CASES OF LAPAROTOMY FOR WOUNDS OF THE ABDOMEN.—(*continued*).

"Pulse" col.: (vf), very feeble; (vs), very small; (v.so), very soft; (vw), very weak; (s), small.

No.	Result.	Hrs. after injury.	Pulse.	Vomiting.	Position of entry wound.	Rigidity.	Tenderness.	Injury found.	Complications.
59	D	14	118	N	Right epigastric.	P	P	One tear in small intestine. Tear in diaphragm.	Left pleural cavity opened. Lung collapsed.
60	D	3½	100	N	Through and through flanks.	P	P	Several large wounds in stomach (gastrectomy). Tear in colon. Liver smashed up.	—
61	R	4	88	N	Left flank.	P	P	Multiple tears in jejunum (2 ft. resected). Two perforations higher up (sutured). Large tear in colon.	—
62	R	7½	84	P	Right flank.	P	P	Large wound of liver, bleeding.	Right pleural effusion (subsequently).
63	D	3	90	N	,, ,,	P	P	Two holes in jejunum. Two holes in hepatic flexure of colon. Wound of liver.	Wound of right chest. Compound fracture right elbow.
64	R	3	88	N	Right iliac region.	P	P	Multiple wounds small intestine (resection). Torn external iliac vein.	Compound fracture rt humerus and rt. thumb. Vomited round worm.
65	R	10	100	N	Right chest behind.	P	P	Two tears in hepatic colon.	Penetrating wound of chest.
66	R	4½	80	N	Epigastrium.	P	N M	Wound of liver, escape of bile.	—
67	R	12	88	N	Right chest.	—	N	Penetrating wound of liver.	—
68	D	16	80	N	Left buttock.	P	P	Many holes in small intestine.	Penetrating wound of chest. Peritonitis.
69	R	3½	88	N	Right chest.	—	P	Penetrating wound of liver. Much bleeding.	Right chest penetrated.
70	R	3½	88	P(h)	Left chest.	P	P	Two large wounds of stomach. Hole in diaphragm.	Penetration left chest.
71	R	5	96	P(h)	Left flank.	P	P	Two wounds of stomach. Wound of left kidney.	Urinary fistula, since healed up
72	D	6½	120	N	Right chest.	P	P	Much bleeding from lacerated spleen. Splenectomy.	Left chest opened up.
73	D	10	80 (vs)	N	Right epigastric.	P	P	Extensive laceration of liver with hæmorrhage.	—
74	D	11	95	P (h)	Left flank.	P	P	Two holes in small gut. Three in large gut.	General peritonitis; lived 10 days. Died of broncho-pneumonia.
75	D	12	96	—	Right rib margin.	P	P	Deep laceration of both lobes of liver.	—
76	D	12½	92	N	Right flank.	P	P	Transverse colon riddled. Resection.	—
77	D	12	92	N	Lt chest posteriorly.	P	P	Laceration of spleen.	Left chest opened. Wounds right arm.
78	D	2	—	N	Left and above umbilicus.	P	P	Stomach torn from end to end. Several tears in small gut. Splenic flexure (resection).	—
79	R	7½	80	—	Glancing wound of chest and right abdominal wound.	P	P	18 in. of gut prolapsed. Two tears in jejunum, one 1½ in. long.	—
80	R	3	80	N	Right flank.	—	—	Transverse colon divided three-fourths of its circumference. One hole in small intestine.	Fractured right ilium.
81	D	9½	102	N	Right buttock.	P	P	Colon divided. Several tears in small gut.	,, ,,
82	D	4½	80 (vso)	P	Right rib margin.	P	P	Wound of liver. Two wounds of stomach. Multiple wounds of small intestine. Kidney lacerated (nephrectomy).	—
83	R	6	84	N	Left buttock.	N M	P	Three holes in sigmoid flexure.	Fractured left ilium. Wound right leg.
84	R	5½	84	N	Left lower chest.	P	—	Two holes in stomach, size of florin. Penetrating wound of liver.	Fractured ribs left side.
85	D	5	80	P	Through flanks. Omentum prolapsed from each.	P	P	Large tear in stomach. Large stellate wound of liver.	—
86	R	4	100 (vw)	P	Right buttock.	P	P	Small intestine almost divided. Much hæmorrhage.	Fractured right ilium.
87	D	2	80	N	,,	P	P	Small intestine almost divided in two places. Cæcum torn.	Fractured right ilium. Large retroperitoneal hæmorrhage.
88	D	8½	104	N	Multiple.	P	P	Six holes in small intestine. Two holes in sigmoid.	Wound of thigh. Wound of right hand.
89	R	6	96	N	Left flank.	N M	P	Two wounds in small intestine. One hole in transverse colon. One hole in omentum.	—
90	R	8½	92	N	Right buttock.	P (rs.)	P (rs.)	Much retroperitoneal hæmorrhage. Bladder opened on right side. Peritoneal cavity punctured in two places. No bowel injury.	Multiple wounds of both buttocks, head and right side.
91	R	4	92	P	Umbilical region.	N	—	Three holes in small gut.	—
92	R	4	80	—	Right rib margin.	P	—	Penetrating wound of liver. Wound of right kidney.	Large retroperitoneal hæmatoma. Wound of face, hand, and chest.
93	R	2	98	N	Left chest.	P	—	Spleen torn and bleeding. Splenectomy.	Penetrating wound of left chest.
94	D	17	94	N	Left loin.	P	P	Two holes in small intestine.	General peritonitis. Died of bronchitis tenth day.
95	D	3	130	—	Left buttock.	—	—	Small bowel prolapsed. Multiple large holes in small intestine (resection). Sigmoid torn through.	—
96	D	8	104	N	Right epigastric.	P	—	Two holes in small intestine. Much bleeding from hole in mesocolon.	Peritonitis present.
97	D	8	93	N	Left flank.	P	—	Wound 1½ in. long in splenic flexure.	Wound right arm. Hæmorrhage from axillary vein.
98	D	11	84	P (h)	Left epigastric.	P	P	Wounds anterior and posterior surfaces of stomach. Wound of head of pancreas.	Died fifth day.
99	R	8	—	—	Left chest.	P	N M	Wound of liver and spleen.	Penetrating wound left chest. Subsequent resection for empyema.
100	R	3	64	N	Left buttock.	P	P	Hole in rectum. Hole in small intestine.	Penetrating wound right pelvic wall.
101	D	5	84	P	Epigastric.	P	P	Two holes in stomach. Holes in transverse colon. Damaged left kidney.	—
102	R	5	108	P	Left buttock.	P	P	Six wounds as large as a shilling in small intestine. Hole in mesentery. Bleeding.	—
103	D	18	94	N	Left flank.	N	N	Five holes in small intestine.	Symptoms on admission extremely masked by morphia. Wounds of left shoulder and forearm.
104	D	5	100	N	Epigastrium.	N M	N M	Three holes in stomach. Descending colon torn in two.	Severe flesh wounds in both thighs.
105	D	6½	88	N	Right buttock.	P	P	Four holes in ascending colon.	Fractured right ilium.
106	D	9	108	N	Left loin.	P	P	Two holes in stomach. Two holes in jejunum, one almost complete. Three holes in splenic flexure. Left kidney damaged.	Multiple wounds in thighs and buttock.
107	R	2½	78	N	Left of umbilicus.	L	L	Abdominal wall torn. Omentum protruding and removed.	—
108	D	5	138	N	Right buttock to left buttock.	N M	P	Extensive retroperitoneal and intraperitoneal hæmorrhage. No injury to gut.	Sacrum smashed in two.
109	D	14	86(s)	N	Right chest.	P	P	Large wound in right lobe of liver.	Penetrating wound in right chest. Right lung collapsed.
110	D	2	76	N	Left iliac fossa.	—	—	Most of small gut prolapsed. Gut torn through and [illegible] in two places (two resections).	Wound of leg.

A large incision is made nearly from ensiform cartilage to pubes. A central opening is preferable to one through the pararectal line, even when the damage is on the flank, for one gets less bleeding in the parietes, also a better opening is produced for examination of the interior and the surgeon can commence with a less anæsthesia and before a complete relaxation of the muscles is attained. If later in the operation there is any difficulty in dealing with such parts as the spleen or colic flexures, a transverse incision into the flank may be made, and it is surprising to note how well and firmly this subsequently heals.

Blood is present in the peritoneal cavity in almost every case, but this may be disregarded and a routine examination made at once, first of the small intestine commencing from the cæcum, then of the large intestine commencing from the same place, followed by an overhauling of the stomach, liver, spleen, and kidneys. The damage, as met with, is repaired. Wounds in the intestine are sewn if possible rather than a resection done. We have learned by experience that the mesentery may be separated from the gut for a distance of 2 or 3 inches without the blood-supply of the bowel being impaired.

Quickness and gentleness are the essentials of the treatment of abdominal injuries. In sewing up, through-and-through salmon-gut sutures are first placed in position and the peritoneum is closed with a catgut stitch. In cases where the peritoneum does not come together easily, especially above the umbilicus, we bring it together with catgut passed through the peritoneum and rectal sheath. The salmon-gut sutures are then tied. Time must not be lost in elaborate closing of the belly wall. As a rule, it heals soundly and cleanly. In three cases a part of the abdominal wall gaped open about the tenth day and had to be restitched, but no ill resulted, and the patients made good recovery.

Saline is given intravenously on the table, if necessary, but not as a routine, as we have thought that bronchial secretion was increased by this measure.

When the patient is sent back to the ward he is placed for 8 or 12 hours with the foot of the bed well raised. Subsequently he is made to assume Fowler's position. During the first few hours after operation every endeavour must be made to combat shock and to keep up an adequate blood pressure in the circulation. To this end we employ subcutaneous or rectal saline injections, pituitary extract, and the judicious use of morphia. For the same reason it is not wise to restrict for too long the giving of nourishment by the mouth.

Thirst is always a distressing symptom, and frequent small drinks of water, albumin water, peptonised milk, or weak beef-tea are allowed from the commencement. Occasionally, due to atony, the stomach becomes over-distended, and this is shown by frequent small bile-stained vomits. Lavage of the stomach is then resorted to, generally with great relief to the patient.

Results.

The nearer the front the operating centre is situated, and the earlier the cases are brought to it, the higher will be the mortality owing to more patients arriving alive who would have succumbed if they had been transported farther back. At the same time, one hopes that more lives are saved. Statistics of necessity must be somewhat fallacious, as the majority of patients have multiple wounds involving other parts of the body besides the abdomen.

The results of six months' work give the following figures:—

Total number admitted with abdominal wounds, 263.
Recovered, 136 = 51 per cent. Died, 127 = 49 per cent.
Total number admitted "with penetration," 180.
Total number on whom a laparotomy was performed, 110.
Recovered, 46 = 41·5 per cent. Died, 64 = 58·5 per cent.
Laparotomies performed where wounds of solid viscera only were found, 21.
Recovered, 13 = 62 per cent. Died, 8 = 38 per cent.
Laparotomies performed for injuries to hollow viscera only, 62.
Recovered, 22 = 35·5 per cent. Died, 40 = 64·5 per cent.

The following analysis gives the relative frequency that the different organs were wounded in our series of laparotomies: Stomach, 14; small intestine, 60; large bowel, 40; rectum, 3; liver, 24; spleen, 11; kidney, 14; bladder, 3.

Note.—Wounds of the abdomen, though involving the viscera, that were not treated by a separate median incision are not included as "laparotomies" in the above series.

We feel we owe a debt of gratitude to Surgeon-General Sir Anthony Bowlby and Colonel Maynard S. Smith for much encouragement and advice in our work, and to Surgeon-General Bruce Skinner for help and support given us on many occasions.

THE SURGERY OF AMPUTATION STUMPS,

BASED ON THE EXPERIENCE OF 2000 CONSECUTIVE CASES.[1]

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THE surgery of amputations has entered a new era with the war. There are various reasons for this development. First, it must be remembered that in the experience of this generation modern aseptic methods meant a negligible number of amputations. Then, the experience of the past generation of surgeons (who were of necessity masters of the art) is not really applicable to the present circumstances. The old surgeons planned their operations essentially for speed and for use of peg limbs; and the classical operation for the foot belonged to an age when artificial joints had not been introduced. Nowadays the aim of an amputation must include the ultimate fitting of the often delicate and complicated artificial limb which the modern instrument-maker produces.

Primary amputations are performed to arrest infection, and so to save life. Further operation, or radical treatment, is commonly necessary in England to prepare or improve the stump, so that eventually a satisfactory limb may be fitted to it. The aim of this article is to elucidate this secondary treatment—that is, the preparation of stumps for artificial limbs—and is based on the experience of nearly 2000 cases which I have seen at the Pavilion Hospital, Brighton. At the same time these considerations will give a basis for action in the case of the primary amputations.

Classification of Cases.

The cases seen at the Pavilion Hospital have been amputated two months to two years before coming under my care, and may be roughly classified as follows: (1) Good stumps not ready for an artificial limb; (2) unhealed stumps from primary amputations; (3) sequestrum formation; (4) sinus; (5) bad scars and eczemas; (6) pain or tenderness; and (7) joint contractures. Three months must be taken as the minimum time in which an amputation stump can become ready for fitting an artificial limb, and then only if a tight bandage has been worn and massage used daily. The bandage and the massage accelerate the shrinking of the stump.

Unhealed stumps are, as a rule, the result of the so-called guillotine amputations. An amputation of the guillotine type, or one in which the flaps have not been stitched up, should be treated with continuous skin extension from the earliest possible moment until healed or operated on again; continuous extension will almost cover a guillotine stump in a few weeks

Every infected stump, after healing is well advanced, suddenly shrinks and the skin becomes loose; when this occurs the time has come to re-fashion the stump. The length of time varies with different stumps, but two to three months is a usual time for the thigh; it may be longer. If this time is chosen it is sometimes possible to remove the scar and bring the skin edges together without shortening the bone. It is hardly ever necessary to remove more than half to one and a half inches of bone. The importance of a few inches in length of the bone cannot be over-estimated in most amputations. The other advantage of waiting is the improvement in general health, and the higher resistance to infection that the patient develops.

I have been very much struck, in studying the medical history of the cases under my care, by the large number of bad stumps the result, as far as one can judge, of operating on guillotine stumps within two months of the original amputation. It would appear that the risk of infection is much greater in the early days, either because the infection is more virulent or the patient's resistance is lower, or both. At any rate, the very large number of cases suffering from necrosis of bone that I have to deal with at the Pavilion Hospital are almost all in stumps that have been shortened within two months of a guillotine amputation, and, further, in my own cases where I have to shorten guillotine stumps (which I now postpone until the local and general condition

[1] Abstract of a paper read before the Brighton and Sussex Medico-Chirurgical Society.

indicates that the time has arrived for operation), although sepsis is met with from time to time, it is never of such a nature as to cause necrosis of bone; and, except in two cases, I have not been obliged to remove more than two or three stitches for irrigation and drainage. Even if necrosis of bone does not occur, severe sepsis leaves a bad irregular surface where long flaps with muscles have been used, or a large scar adherent to bone where skin-flaps only have been used. In both cases further operation is often necessary.

Sequestrum.—No stump is ready to send to the instrument-maker until it has been radiographed, as it is quite a common thing for a stump to heal and yet contain a sequestrum, with the result that as soon as an artificial limb is worn an abscess forms and a sinus results. If the sequestrum is small at least two pictures should be taken to enable the surgeon to know where it is, so that it can be removed with the least possible damage to the stump. Sequestra in stumps are generally buried in new bone thrown out from the end of the shaft. The amount of new bone is often very large, and I have had to remove as much as an inch of new bone before coming to the sequestrum. New bone which is cancellous can be chiselled away freely, but the shaft of the bone must on no account be injured, because the inflammatory reaction following this operation is often very severe, and should the shaft be injured there is a risk of further necrosis.

Sinus.—Sinuses in stumps are due to (1) silk ligatures, (2) necrosis of bone, (3) foreign matter, such as metal, or (4) long septic tracks in scar-tissue which are unable to close from imperfect drainage and low vitality. I always use a crochet-hook instead of a probe in examining a sinus, and with this very useful little instrument ligatures or small sequestra may be removed. It is not advisable to operate on a sinus with a view to removing ligatures unless repeated attempts with a crochet-hook have failed. When silk is the cause of a sinus there are often several pieces. In one case 17 silk ligatures were discharged from a thigh stump in the course of three months. Four or five is a more usual number, and a great deal of harm may be done to a stump by exploring for silk. Silk should never be used for ligatures in operating on amputation stumps, for it is the cause of 40 per cent. of the sinuses I treat, and causes prolonged convalescence and needless suffering.

The second and third causes of sinus, necrosis and foreign material, require localising by the aid of X rays, and the remarks made under "sequestrum" apply.

The fourth class of case, the long septic track in scar-tissue, is difficult to diagnose, and can only be proved by exploration of the sinus. If nothing in the nature of a foreign body is found, I place the case in this class and excise the skin round the sinus and remove the deep part of the scar and then sew up the wound. Packing the wound and attempting to obtain healing from the depth often leads to a bad puckered scar; the stitches can always be removed if necessary.

Pain in the stump or tenderness of the stump.—Causes: (1) Nerves adherent to the scar; (2) bulbous nerves; (3) sequestrum in new bone in a healed stump; (4) spurs of new bone; (5) chronic abscess. Nerves adherent to the scar (the result of not shortening the nerves at the time of amputation or when shortening the stump) always have to be removed, and in this connexion it is important to remember that a nerve such as the internal saphenous is as important as the great sciatic, both in the thigh and in the leg. As a rule, removal of the nerve from the scar is the best procedure, but in the case of short leg stumps I always remove the popliteal nerves at the bend of the knee and the internal saphenous in Hunter's canal, for by this means there is no fear of the new cut end receiving pressure from the bucket and so becoming tender again. Should an amputation stump suppurate there is grave risk of the nerves becoming adherent and painful, even if shortened. Bulbous nerves not adherent to the scar, as a rule, become painless in about three to four months, and so I do not remove them until I have waited this length of time. The converse is true, and bulbous nerves not tender or painful sometimes become so after three or four months, and when this occurs I remove the bulb, as the prognosis is bad without operation. One bulbous nerve may cause extensive symptoms, such as a large area of hyperæsthesia, and in one case it gave rise to epileptiform fits. These occurred over a period of some months, but ceased altogether after removal of the bulb.

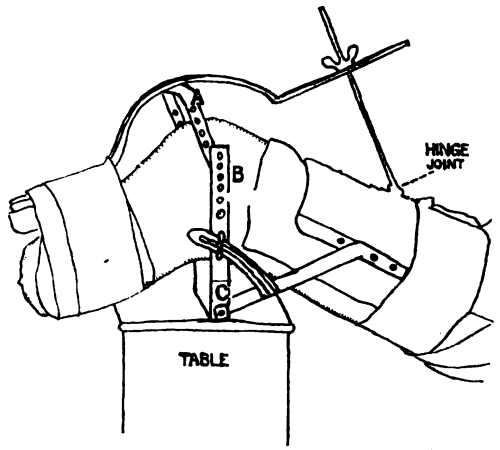
Spurs of new bone.—Spurs of new bone are common, and every now and then cause pain and require removal. The large amount of new bone formation in stumps that have been infected is striking, and it often takes on fantastic shapes and follows muscular attachments and sinuses. Spurs running into the adductor muscles are the most common, and it is in this situation that I have sometimes had to remove them on account of pain. It is important to be sure that the pain apparently due to the spur is not caused by a bulbous nerve, as in my experience it is rare for a spur alone to cause pain.

Chronic abscess.—In these cases the diagnosis will generally be bulbous nerve, but instead of a nerve a small abscess will be found, sometimes round a ligature and sometimes with no apparent cause.

Bad scars and eczema.—There are two classes of unsatisfactory scar—one due to insufficient covering of the bone end and the other to too much covering—in stumps that have been infected. In the first group, if the scar is very large and liable to ulcerate it is necessary to excise it after skin extension has been used. In the second group, if the edges are very puckered and turned in the scar is liable to eczema; and in leg stumps, after wearing an artificial limb, it is apt to break down from the softening which results from the sweat decomposing. In excising the scars of the second class it is important to re-fashion the deep parts as well as the skin, otherwise the condition will relapse when healing occurs.

Joint contractures.—In a great number of cases which I see the following conditions are found: (1) Flexed knee; (2) flexed and abducted hip; (3) adducted shoulder.

Flexion deformity of the knee-joint, if only of a mild degree, is cured with massage and a back-splint. If more severe and of several months' standing, I use a splint made



Splint for straightening flexed leg stumps.—Splint applied to flexed leg stump. The joint at C, and the ability to alter the length of the bars C, B and B, A, enable the splint to be centred over the knee-joint in any case. The splint was designed to be fixed in plaster-of-Paris.

for me by Major Lightfoot, of the Hove War Hospital Supply Depôt, and by means of this splint most flexed knees can be straightened. If this fails the posterior capsule of the joint should be divided with a tenotome. Tenotomy of the hamstrings alone is not likely to correct the deformity if adequate splinting has already been tried without success.

The deformity of flexed and abducted hip is usually corrected by massage and movements; but in the event of failure tenotomy of the tensor fasciæ femoris should be done, and in some cases it is necessary to divide the anterior portion of the capsule of the hip-joint. The correction is maintained by a plaster-of-Paris spica. An artificial limb can never be worn satisfactorily with a flexed thigh stump.

Adduction deformity of the shoulder is treated with massage and movements; if these fail an anæsthetic is given, and the condition forcibly corrected, the correction being maintained for some weeks in a plaster-of-Paris splint.

Joint contractures can, and should, be prevented by daily movements of the joints likely to become contracted, aided by bandages and splints. It is impossible to splint properly, or to move a stump, when the nerves have been left unshortened, as the pain is too great.

Considerations guiding Shortening of Amputation Stumps.

In shortening stumps I only use skin flaps, and the flaps used are shorter than the flaps generally recommended in

text-books. Too much skin gives a bad flabby stump, which becomes ultimately badly nourished. I never now use muscle in the flaps, as, rather than being an advantage, it has several disadvantages; in practice a guillotined arm stump is often better than the stumps resulting from skin and muscle flaps. When shortening amputation stumps I am guided by the following considerations:—

The Foot.—A Syme amputation with bone section a quarter of an inch above the articular surface of the tibia, and with all the bony projections rounded off, gives a stump short enough to fit an artificial ankle, and is end-bearing. This must be regarded as the best amputation that can be done. A Pirogoff stump is too short to use as a peg and too long to fit an artificial foot to; it is an amputation of no practical value, and should never be done. The stump of a Chopart, as a rule, becomes deformed, and even if it does not it cannot compare with a Syme, owing to the difficulty of fitting an artificial appliance. A guillotine Chopart as a primary operation leaves the necessary material for doing a satisfactory Syme later.

The Leg.—Amputation in the middle third of the leg, at the lower end of the prominence of the calf, using a long anterior and short posterior flap, gives the most serviceable stump below the knee with the exception of a Syme. Amputations in the lower third of the leg give a weak scar, liable to ulcerate in winter, and they necessitate the wearing of a clumsy and heavy artificial limb. Amputation at the seat of election should not be done if greater length can be given, and never merely to improve the scar, unless end-bearing can be obtained for certain; in the absence of end-bearing the importance of an extra inch of lateral bearing cannot be overestimated. Unless two fingers can be placed side by side on the inner side of the posterior surface of a leg stump when flexed, the stump is too short to use a below-knee artificial leg, and a kneeling leg will have to be worn. When shortening a leg stump it is advisable to do a supracondylar amputation, unless this length of stump can be obtained.

The Knee.—Amputations through the knee must be well covered, and it is unusual for enough skin to be available, for if enough skin is available a short below-knee stump could, as a rule, be obtained. The patella should always be removed in amputations about the knee. The best amputation about the knee is through the top of the condyles, rounding off all bony projections, and if this be done an end-bearing stump is made which is short enough to allow an ordinary artificial knee-joint to be fitted. Stokes-Gritti's amputation is an unnecessary refinement unless the bone section has to be made above the cancellous part of the femur, and then it should be used to make the stump end-bearing.

The Thigh.—Every inch of the femur above the condyles is of the utmost value until the upper third is reached. In this situation, unless two and a half inches of bone below the lesser trochanter can be saved, a thigh bucket cannot be used. Therefore it is best to amputate through the neck of the femur, when this amount of bone is not available; a less severe amputation that will be satisfactory is just through the junction of the great trochanter and shaft.

The artificial leg for a hip-joint amputation is a sound practical appliance and can be fitted to a subtrochanteric amputation. It is not satisfactory with longer stumps or with a long fleshy stump, such as the Furneaux Jordan. It is important to consider this before interfering with a guillotine stump in the upper half of the thigh. I often see nice-looking stumps, the result of re-amputation, which are too short for a thigh bucket and bad or impossible for a hip bucket, and, moreover, some of them are covered with muscle, showing that more bone could have been saved. A conical stump can no longer be regarded as necessarily bad, as they are often satisfactory.

The Wrist and Forearm.—One movable finger is better than any artificial appliance that can be obtained. Through-wrist amputations must now be regarded as satisfactory. Every inch of bone from the lower end of the ulna to within three inches of the upper end of the ulna is of value; less than three inches of ulna cannot be made use of, and so, when compelled to re-amputate a forearm stump, unless three inches of ulna can be left, it is best to do a supracondylar amputation, removing the supracondylar ridges.

The Arm.—Every inch of humerus above the condyles is useful. Guillotine stumps make better stumps than amputations where muscle is placed over the end of the bone. Unless one and a half inches of bone below the anterior axillary fold can be saved the shoulder-joint cannot be used. The shoulder-joint artificial arm does not press on the stump, and so it is not necessary to remove bulbous nerves from these very short stumps unless they give rise to neuralgia.

Summary.

No secondary amputations should be performed in cases of guillotine amputations until all œdema has disappeared and skin extension has been employed for six weeks.

Guillotine amputation stumps above the middle of the leg or middle of the thigh should never be shortened until healed unless it is decided that the knee-joint or hip must be sacrificed. When shortening has to be done the minimum amount of bone necessary for utilising the joint above should always be borne in mind. A guillotine amputation may make a satisfactory stump in the leg and thigh, and almost always does in the forearm and arm without further re-amputation.

Bone in a stump does not necrose unless infected. Delay in shortening stumps reduces the risk of infection, because infection is not in the wound only but in lymphatics leading from the wound. The amount of matting round the vessels leading to or from an amputation stump is very striking.

Silk should never be used for ligatures in operations on stumps. Amputations should be done by skin-flaps only, and no muscle should be utilised in the flap, the pad of fibrous tissue formed over the end of the bone from the organising clot being all that is necessary. All nerves, and not merely the main nerves, must be shortened at the time of the amputation or re-amputation.

To prevent deformity, daily exercising the joints and the employment of splints and bandages are essential measures in preparing the stump for the artificial limb.

A good Syme amputation leaves the patient with little disability, and amputations through the tarsus should never be done as a secondary operation.

KORSAKOW'S PSYCHOSIS IN ASSOCIATION WITH MALARIA.

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DURING the war a large number of patients have been seen who have lost their memory. This is not infrequent among those who are suffering from the effects of shell shock. In other cases the condition has undoubtedly been simulated in order that the patient may have a better chance of escaping from uncongenial service or it has been assumed to excuse some breach of discipline. A few patients have come under observation in whom loss of memory was one of the signs of dementia paralytica and in several others it occurred after concussion of the brain. In the latter class of patients it is not uncommon to find that the memory of the accident or of the circumstances which lead up to it is completely lost. In several of the forms of alcoholic insanity, for instance in delirium tremens and in chronic alcoholic poisoning, it is common to find that the memory is defective. It occurs too in some forms of senility and also after attacks of epilepsy.

Among these various conditions there stands out prominently that form of loss of memory which was described originally by Korsakow as occurring in patients of alcoholic habits who showed also signs of peripheral neuritis. The condition was known as the polyneuritic psychosis. Frequently, however, it could not be proved that alcohol took any part in bringing about the disease, and later it became established that other illnesses, such as typhoid, malaria, diabetes, arsenical poisoning, &c., all of which are at times associated with peripheral neuritis, may give rise to the particular peculiarities described by Korsakow. Furthermore, many cases are on record in whom neither alcohol nor peripheral neuritis appeared to have any part, and it is agreed at present that, while the typical cases are met with

in alcoholic patients with neuritis, similar symptoms, which are indistinguishable from them, may be met with occasionally without neuritis and without alcoholism.

The essential features of the disorder are loss of memory for recent events and difficulty in concentrating the attention. The mental disturbance is one mainly of confusion of thought, disorientation, and forgetfulness. The patient loses the power of keeping events in their chronological order, and he constantly transfers to the present experiences which belong to the distant past. He lives in a state of reminiscence.

The following account is that of a patient who showed this condition. He was a stoker, aged about 45, and he was admitted to Haslar on Nov. 6th, 1916. The few notes which he brought with him showed that he had been admitted to hospital in Bombay on Oct. 15th, 1916, and later to the 15th General Hospital at Alexandria. The notes stated that when he arrived at the latter place he was very anæmic and had œdema of the lower limbs as high up as the lumbar region, and that this condition had been present for six weeks. The urine showed degenerated hyaline and epithelial casts, but neither albumin nor blood was detected.

When he arrived at Haslar on Nov. 6th there was no œdema and the urine was normal. He was very weak and anæmic, but no disease was detected except some recent gouty arthritis of his left wrist. Gout was also detected in the right ear and in the great toe on the left side. The red cells numbered 4,650,000 and the leucocytes 10,000 per c.mm. Of the latter 52 per cent. were polymorphonuclear cells and 46 per cent. were lymphocytes. He was observed from the first to be rather dull mentally.

On Dec. 10th his temperature went up to 104° F. suddenly and malarial rings were found in his blood by Dr. P. Fildes. The attack rapidly subsided with the administration of quinine and on Dec. 14th he was transferred to the neurological department for further observation of his mental condition. For the notes already given I am indebted to Surgeon T. G. Gibson, R.N., under whose care the man had been.

In his story the patient told us that he was born on June 10th, 1866, that he lived at a certain address at Fulham, and that he had a daughter aged 12 years. He said also that he had seen his wife recently at the hospital. These statements it was not easy to disprove at the time, and indeed the idea of attempting to disprove them did not occur to us then. Later, however, when he told us that the year was 1899, that King Edward was reigning, and that the war was between England and some field force and had been going on for four years, it was evident that we were dealing with some serious form of amnesia.

The man was well nourished, but pale, and he looked a little simple. He spoke quietly and politely and said that, with the exception of the pain in his wrist, he felt quite well. He told us that he had suffered frequently from "intermittent fever" and that his last attack was about three months ago, when his temperature was 104°. He said that he was ill for a week.

He told us that he was for eight years on the active list and that he then became a labourer, implying that he had become a reservist and that he had been called up for the war. This was supported by the fact that he was wearing a well-grown moustache which he said he had let grow for some time. He said that he had not been in action. He did not know the name of the hospital, and his ideas about the war were hopelessly confused, but he was able to do sums well and he read intelligently. He constantly stroked his moustache and chin with his hand. He did not appear to be worried particularly about his loss of memory, but he recognised that matters were not as they should be. He kept to himself a good deal, but appeared to be quite happy and contented.

He remembered having been at Bombay but had no recollection of his illness there or of the swelling of his legs. He could not tell us anything about his voyage home or about Christmas a fortnight before. He stuck to his statement that King Edward was on the throne, but he could not give the name of the Queen or of the Premier. When he was at a loss for a reply he used to say that he did not "read the papers carefully enough for that." He knew that Lord Roberts was in command during the Boer War, and said that he expected that he was still "somewhere on the frontier," but he would not hazard which frontier he referred to. He knew where he had been to school, and said that he was in the sixth standard. He recalled that he had been engaged to be married for about a year. He knew all about the circumstances associated with the relief of Ladysmith, but he did not know the name of Sir George White, even when it was mentioned in conversation. He said that he was a bald man, and that he knew his photograph well. When he was reminded about the battle of Jutland and of the Falkland Islands he appeared to recall them, but he remembered nothing about them. For instance, he did not know between which peoples the battle of the Falkland Islands was fought, but he thought that "England was there." He remembered that the Boer War was between England and the South Africans, but he knew nothing at all about the Jutland battle, and when pressed for some information about this battle he said that it was at sea and in the air, between England on one side and some country whose name he could not remember on the other. He said further that it was a kind of bombardment, and that Lord French was in command there, just as he had been at the Falklands, "because they must have had some troops there." He remembered the Diamond Jubilee, and thought that it took place in 1887. Later on, when pressed for more information about the war, he said that it was between England and the Balkan States.

On examination his gait was seen to be normal and he had no tremors. The spleen was not palpable. His systolic blood pressure was 140 mm. Hg. He had no headache and the urine and viscera were normal. His weight was 9 st. 13 lb. There was no evidence of alcoholic excess, nor was there any reason to suspect it. His blood on Jan. 15th, 1917, contained 5,050,000 red cells and 10,300 leucocytes per c.mm., and of the latter 63 per cent. were polymorphonuclears and 34 per cent. small lymphocytes. The hæmoglobin content was 90 per cent.

Nothing abnormal was detected in the central nervous system with this important exception: he had a bilateral absence of his ankle-jerks. This was confirmed repeatedly at subsequent examinations. The calf-jerks were active. There was no history of sciatica, nor was there anything else found to point to a past neuritis.

The association of the mental condition with the absence of ankle-jerks clearly made it imperative to rule out dementia paralytica, in spite of the fact that he did not resemble a case of this disease. The Wassermann reaction in the serum and in the cerebro-spinal fluid was found to be negative by Dr. Fildes, and the cerebro-spinal fluid contained no cells.

On Jan. 20th his wife came to see him. She brought her step-daughter and two friends. Several letters written to her at the address at Fulham which was given to us by the patient had been returned to us and finally his correct address was obtained from the Admiralty. It was in Portsmouth, where he had lived for four years. His wife told us that she had not seen her husband for nearly four years, when he was last on leave. As far as she knew, his previous health had been good. He had done 18 years' active service and had commissioned the *Pyramus* at the onset of war. She thought that he was still in this ship and had been worried because she had not heard from him for some time. The last letter she had received was from the Sailors' Home at Bombay during November, 1916. She had no knowledge that he was sick. She said that he had been a labourer formerly and that she had been married for 21 years.

The man recognised his wife and friends, but was not able to join in the conversation as readily as they wished. He told them that he must have grown his moustache on his way home. He caused considerable surprise by solemnly announcing that Lord Roberts and General Buller were in command at the battle of the Falkland Islands. The following day, Jan. 21st, he recollected having seen his wife, but thought that she had brought with her his little girl. He was reminded that he lived at Portsmouth, but up to the last he said that he lived at Fulham and that he was going there on his discharge. He was discharged to his home on Jan. 22nd, 1917.

The wife's story is put in here so that the reader will be in possession of the actual facts of his personal history before he reads the short list of the man's answers to various questions which is appended. It was very evident, during daily conversation with the patient, that he was living through the period of the Boer War over again. His memory for past events was not perfect, but it was far better than that for events of the present time. In a few instances, such as that of the intravenous injection, his memory for events of the immediate past was completely in abeyance. However, when his mistakes were pointed out to him he would sometimes avoid repeating them the next day. In some cases, when he made correct replies to simple questions of fact, it is likely that he had been told the answers by the other patients.

Jan. 3rd, 1917.—What is the name of the King?—Edward or William
What is the name of the Prince of Wales?—George.
What year did you join the Service?—1899.
Who is head of the Army?—Lord Roberts or Lord Kitchener
When did the war start?—1890.
What month is it? (January.)—December.
What Queen is reigning?—Queen Victoria.
Who is Prince of Wales? Prince Edward.
Where does the King live in London?—Buckingham Palace.
How long have you been in hospital? (Two months.)—Ten days.
Who is head of the Navy?—Admiral Jellicoe.

What was the name of his ship?—*King Edward*.
Who married Lord Kitchener?—No one.
What is the name of Admiral Beatty's ship?—*King Edward*.
Have you been on the Reserve List?—Yes, after doing 12 years' service.
When did you rejoin?—At outset of war.
Where did you spend last Christmas?—Has no idea.
What ship did you travel home in? (*Britannic.*)—*Tyne*.
Where did you spend Christmas?—At home.
Have you ever been in a decorated ward?—Yes, in the present ward, but I do not know why it was decorated.

On Jan. 4th I asked him when he had last seen me, referring to his catechism of the 3rd. He hazarded, "The day before yesterday, in the ward, at 11 A.M.," but he did not know what we talked about. As a matter of fact, the interview was in Sister's cabin, and at 6 P.M.

On Jan. 5th, at 10 A.M., I gave him an intravenous injection of "914," with the idea of stopping future attacks of malaria. He had never had any injections previously. At 4 P.M. he had no recollection whatever of the injection, and when I asked him when he would like to commence his treatment, he said that he would leave all that to me.

The mental characteristics of Korsakow's psychosis are clearly portrayed in this patient. It was evident that the absence of ankle-jerks and the mental confusion must be associated if it was possible to do so, and it was fairly clear that the abnormality of the reflexes was due to a peripheral neuritis, although no other sign of neuritis was present. What was the cause of the neuritis? There was nothing to suggest alcoholism as the cause. The only facts which we possessed were that he had gout, and that he had a proved attack of malaria while under observation. There was no reason to think that his gout was the cause of the neuritis. On the other hand, peripheral neuritis has been noted in malaria not infrequently, and Manson remarks in his book that loss of memory, partial or complete, appears to be a common accompaniment of peripheral neuritis of malarial origin. The illness from which the man suffered in Bombay, when his lower limbs were swollen, may have been beri-beri, in which neuritis is common enough, or it may have been malarial nephritis. It is by no means certain, however, that nephritis existed at all. We could not ascertain what this illness was, but in view of the fact that he had malaria (and probably it was not his first attack) it seems not unreasonable to ascribe his polyneuritis and the characteristic loss of memory to the disease described by Korsakow.

THE TREATMENT OF DIABETES MELLITUS.

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THE following is a brief sketch of the line of treatment which I have carried out with much success in many cases of diabetes mellitus during the last three years. Recently many new methods of treatment have been published, some of which are of distinct service. Certain of these methods have, however, disadvantages, and are occasionally followed by unpleasant symptoms. The line of treatment briefly sketched in this article will, I think, be found free from risk if carried out in the class of cases indicated. (To limit the length of this article many of the details of the treatment have been omitted.)

A routine examination of the patient is first made, complications noted, and the abnormalities of the urine determined. When certain complications (affections of the lungs, heart and kidneys, &c.) are detected a special form of treatment may be required and a rigid diabetic diet may not be desirable. Such cases will not be considered in this article.

When the case is one of diabetes without these complications a diabetic diet will be usually suitable. But the form of the disease must first be determined. When the urine gives persistently a claret colouration with perchloride of iron, and if this is not due to drugs, and if other indications of decided acidosis can be detected, the case requires very careful and special treatment; these cases will be briefly considered at the end of this article.

If, then, no complications can be detected which require a special form of treatment, and if the urine should give no reaction with perchloride of iron, and no other signs of decided acidosis can be detected, the following course of treatment may then be carried out.

Course of Treatment.

I. The patient is first placed on Diet I.—an ordinary rigid diabetic diet, but with the addition of 3 oz. of white bread *daily*.

II. If the glycosuria is not checked in a short time (few days) the white bread is promptly replaced by a pure diabetic bread (free from starch, or only containing the smallest amount thereof), such as biogene bread and ponos biscuits, protein bread, &c.[1]—Diet II.

III. If this fails after a fair trial of 10 or 14 days the following Diet III. is often successful if the patient is able to rest at home on a sofa for a short time.

For *one week* only food is taken in small quantities every 2 hours from 8 A.M. to 10 P.M. and the foods are eggs, milk, cream, custard, coffee, tea, and beef-tea. The following is the diet sheet;—

8 A.M.: Tea or coffee with one tablespoonful of cream. One egg (poached, buttered, or boiled).
10 A.M.: One glass of warm milk (10 oz.).
12 noon: Custard unsweetened (containing one egg and half a pint of milk).
2 P.M.: One glass of warm milk (10 oz.) or cream (1 oz.) in warm beef-tea (10 oz.).
4 P.M.: Tea with one tablespoonful of cream; one egg (poached, buttered, or boiled).
6 P.M.: Cream (1 oz.) in 10 oz. of warm beef-tea.
8 P.M.: One glass of warm milk (10 oz.).
10 P.M.: Cream (1 oz.) in warm beef-tea (10 oz.).

In this diet (or in the modification following) the patient receives daily 3 or 4 eggs, 2 to 3 oz. of cream, 2 pints of milk, in addition to tea and coffee and beef-tea.

The various small meals may be changed in order or altered if the patient desires. Thus, at 2 P.M. cream and beef-tea may be taken in place of milk, and a glass of milk at 6 P.M. in place of cream and beef-tea. At 8 P.M. one egg beaten up and added to 10 oz. of warm beef-tea may be taken in place of the glass of milk, or a poached egg and half a pint of beef-tea if the patient prefers. At 10 a glass of milk may be taken in place of cream and beef-tea. Also if the patient prefer an egg (poached or boiled) and a glass of milk may be taken at 12 in place of custard.

This diet often checks the glycosuria in a few days or by the end of the week. If the glycosuria is not checked by the end of the week the diet may be continued for a few days longer; but if it then fails it should be discontinued and the patient placed back on Diet II. for a few days. If the Diet III. has failed to check the glycosuria the patient may be placed on Diet IV. of casein or biogene and cream.

IV. Diet IV. of casein or biogene and cream.

The patient is given for seven or ten days a glass of casein or biogene and cream with water every two hours from 8 A.M. to 10 P.M. The casein preparation lait-proto No. 6 will probably be the most satisfactory for the majority of patients. A cup of tea or beef-tea, or both, may be also taken, if the patient desires, twice a day.

The mixture of casein and cream and water is prepared as follows: One tablespoonful of casein, or lait-proto No. 6[2]; one tablespoonful of cream; mix well in a tumbler with a spoon, then add hot water (or cold if preferred) very gradually, mixing well until the tumbler is full. (The fluid may be sweetened with saccharin, or flavoured with nutmeg if desired.)

In place of *one* tablespoonful of casein *two* tablespoonfuls of biogene[3] may be used if the patient does not like the taste of the casein. It should be mixed with *two* tablespoonfuls of cream and the water added as just described.

Many patients take the casein or biogene quite well, others find both unpalatable, and some cannot take either. Lait-proto No. 6 may be taken quite well when ordinary casein or biogene cannot be taken.

If we wish to avoid using diabetic breads instead of following the order just indicated the trial of Diet II. may be omitted, and if Diet I. fails Diet III. may be tried at once; or if the patient likes the taste of casein or biogene, and can be seen daily, Diet IV. may be tried before Diet III. (at once after Diet I.).

I have found Diet III. (eggs, cream, milk, beef-tea, &c., as indicated) of very great service; it is simple, palatable, and often very successful. It can be taken by nearly all patients and it is less expensive than diabetic food. It can be usually taken quite well by patients who cannot take casein or biogene. It is very useful in the case of diabetic

[1] See article by the writer on Diabetic Bread Substitutes, Brit. Med. Jour., Dec. 23rd, 1916.
[2] Can be obtained from Casein, Ltd., Sheepstone-lane, Battersea, London, S.W.
[3] Can be obtained from Messrs. Callard and Co., 74, Regent-street, London, W.

children. It is often very successful both in mild cases and cases of medium severity, and sometimes in severe cases. In some cases, like all other treatment, it fails. It often removes the glycosuria promptly in a few days or a week, though an ordinary rigid diabetic diet had previously failed. After taking this diet for seven or ten days often the patient may then take ordinary rigid diet for a long period without glycosuria returning, though previously on such a diet the glycosuria had continued. Probably it is not so often successful as the treatment with casein or biogene, but if it fails the latter treatment may then be tried, or a combination of the two methods may be tried. Diet III. or IV. should be continued for seven or ten days only. They are to be regarded as methods of dietetic treatment which are usually much more successful than an ordinary rigid diabetic diet in removing the glycosuria temporarily, and the after-effects probably continue longer. If later the sugar returns in the urine the methods may be repeated. Diet IV. may be successful when Diets II. and III. have failed. In a few severe cases with persistent diacetic acid reaction in the urine Diet III. or IV. removes the diacetic acid as well as the sugar, but they are not always suitable in such cases.

After Diet III. or IV. has been tried for seven or ten days the patient is placed back on Diet II. if the glycosuria continues. If the glycosuria has been checked, then the Diet III. or IV. is gradually changed. One ponos biscuit is allowed at 8 A.M. and 4 P.M. with the egg and tea. One or two days later bacon and green vegetables and custard are allowed at 1, in place of the meals at 12 and 2, and later Diet V. and then Diet II. are allowed.

Of course, the Diets III. and IV. will not be successful in all cases, but they are always worthy of a careful trial, except when the urine persistently gives a marked claret colouration with perchloride of iron. In these cases caution is necessary, and sometimes Diets III. and IV. are not advisable.

V. If all the diets already described have failed to check the glycosuria, then for a short time a diet of suitable vegetables, eggs, and fatty foods may be tried. (Diet V.)

Breakfast: Coffee (or tea) with cream; eggs (buttered, poached, or boiled), or tomatoes or mushrooms; suitable diabetic bread or biscuits; butter. *Dinner:* Bacon cooked in any way. Any of the following vegetables: cabbage, cauliflower, Brussels sprouts, turnips, French beans, spinach, broccoli, boiled walnuts, asparagus, vegetable marrow, tomatoes, mushrooms, salad, lettuce, cucumber, watercress, celery, radishes. Custard. Suitable diabetic biscuits or bread. *Tea or evening meal:* Tea and cream; eggs (buttered, poached, or boiled); or Welsh rarebit, cheese; or salad, lettuce, cucumber, mushrooms, tomatoes, boiled egg and spinach, watercress; suitable diabetic bread; butter.

Or the following diet may be tried for a short time:—

Breakfast: Tea or coffee with cream; one egg and tomatoes or mushrooms or spinach; also one ponos biscuit or other similar biscuit. *At 11 a.m.:* Two tablespoonfuls of cream in half a pint of warm beef-tea. *Dinner (12.30 or 1):* Beef or tomato soup or one sardine and one ponos biscuit. Afterwards one or more of the following vegetables: Cabbage, cauliflower, brussels sprouts, vegetable marrow, broccoli (curly green), boiled celery, asparagus, French beans, turnips, tomatoes, mushrooms, boiled walnuts, Brazil nuts sliced and fried in butter. Custard; stewed rhubarb, gooseberries, or cranberries with cream. *Tea (4 to 5):* Tea with cream, tomatoes or asparagus or celery or mushrooms, lettuce, salad, cucumber, jelly; one ponos biscuit. *Supper:* Beef-tea and cream (as at 11).

VI. If these diets fail to check the glycosuria then drugs may be tried. The drugs which I have found most useful are: sodium salicylate, aspirin, and salicylate of quinine. These drugs may be given along with Diet II. or I. or V. I have been able to *demonstrate clearly*[4] the distinct effect of sodium salicylate and of aspirin in diminishing the glycosuria in certain cases of the milder forms of diabetes, and also in cases of medium severity. Some patients take sodium salicylate better, others aspirin.

The dose of these drugs has usually to be increased to 15 gr. (or more) four times a day before definite effects are obtained, and a careful watch should be kept for toxic symptoms. It is better to use the *natural* salicylate. In certain cases salicylate of quinine, gr. 3 or 4 or more, three or four times a day has appeared to be of distinct service, though I have not been able to clearly demonstrate this by careful hospital observations as in the case of the two drugs just named.

VII. Fast days are sometimes of service. On these days the patient fasts, and takes only tea or coffee, beef-tea or whisky-and-soda several times and no other food. In the less severe cases the glycosuria ceases on these days, but it often returns in a day or two. It may, however, not return for many days, and occasionally for a considerable time it is much less than before the fast days. But so very often I have found the results of little permanent value. A fast day once a week is useful in some cases, but I much prefer the treatment with the two-hourly fluid diets III. and IV., described in this article. I also prefer these diets to the more prolonged fasting which is being so frequently carried out.

When the patient suffers from insomnia or marked neurasthenia bromide of potassium (gr. 30 at night, or 30 early in the evening and 30 late at night) is suitable. Overwork, mental strain, and worry often increase the glycosuria, and should be avoided as much as possible.

If none of these diets or treatments check the glycosuria, then we must be content if we can diminish it by the various treatments described. After a time it is well to allow a small amount of white bread or milk, or both, especially if the urine should give a persistent reaction with perchloride of iron.

In some cases the most careful treatment fails; in others it is successful for a shorter or longer period and then fails. But in some cases it is successful for many years, or even to the end of life.

If we have checked the glycosuria by diet or drugs, then Diet II. may be allowed, and later Diet I. Still later more white bread is cautiously allowed, and then other starchy carbohydrates, if no glycosuria returns. But it is always advisable permanently to forbid sugar and sweet foods containing sugar. The urine should be watched and the diet made more rigid if glycosuria returns, and less rigid when the glycosuria ceases. In this way it is possible in some cases to keep the glycosuria in check for many years, or occasionally until the patient reaches advanced age and dies of some other disease.

Treatment of Cases with Acidosis.

When the urine persistently gives a deep claret colouration with perchloride of iron and other signs of acidosis are noted the outlook is unsatisfactory and very cautious treatment is desirable. In spite of continued treatment such cases frequently advance to diabetic coma. But sometimes by careful treatment this is checked for a long time, and by treatment the perchloride of iron reaction may disappear and sometimes the sugar also, at least temporarily.

The perchloride of iron reaction and other signs of acidosis may disappear in some cases when carbohydrates (3 oz. of white bread daily and three glasses of milk daily) are added to the rigid diabetic diet. In many cases after aperients the perchloride of iron reaction ceases for a short time. Heavy oxide of magnesia, gr. 60 or more at night, is a very suitable aperient, or gr. 30 three times a day in a little milk half an hour after meals. After calomel, gr. 1, three times a day and after treatment by an oatmeal diet (oatmeal porridge and milk three times a day) for two or three days the perchloride reaction may cease, and also after the two-hourly diet with eggs, cream, and milk, Diet III., or after the diet with casein and cream, Diet IV. After these two Diets III. or IV. I have seen both the glycosuria and diacetic acid reaction to cease in some cases, but in many cases both diets fail.

Diets III. and IV. are not suitable in some of the most severe cases of diabetes with persistent diacetic acid reaction in the urine. In such cases I hesitate to advise them, but even in a few of these cases I have obtained excellent results temporarily, especially with Diet III., and the urine has become free from both sugar and diacetic acid. In many of these cases both Diets III. and IV. fail, and they are not advisable in many of the very advanced cases. If tried in these cases with persistent acidosis Diet III. is preferable to Diet IV. and may be given in many of the less severe cases. When Diet III. or IV. is tried I often allow in addition for the first two days only a *small* amount of oatmeal porridge twice a day.

[4] See the writer's articles on the Treatment of Glycosuria and Diabetes Mellitus with Sodium Salicylate, Brit. Med. Jour., March 30th, 1901; with Aspirin, ibid., Dec. 27th, 1902; Treatment with both Drugs, Med. Chron., May, 1906, and Practitioner July, 1907.

It is curious that when the sugar excretion cannot be checked by the casein treatment or by Diet III. in these severe forms of diabetes with acidosis, in some cases the diacetic acid disappears from the urine, whilst in others it remains much the same. In a few cases the sugar excretion is arrested by the casein treatment, but the diacetic acid remains in the urine.

To summarise briefly, we may say that in these cases with persistent acidosis the ordinary rigid diabetic diet is not suitable. A small amount of carbohydrate (3 oz. of white bread daily and three glasses of milk) should be added to the rigid diet, the meat should be restricted; fatty food and green vegetables are very suitable. The bowels should be kept quite regular. Citrate of soda 30 gr., increased to 60 gr. or more, three or four times a day, and 60 gr. of bicarbonate of soda at night, in soda-water or milk, are of service, and larger doses may be given. Alcohol (whisky or brandy) is probably of service.

In course of time usually cases of severe diabetes with marked and persistent acidosis which cannot be arrested gradually advance to diabetic coma. Severe constipation, physical overstrain, and mental shock or anxiety are all very liable to excite coma in these cases, and hence they should be carefully guarded against. If the diacetic acid and other signs of acidosis cease then the outlook is, of course, much more satisfactory. Then the treatment and Diets I. to IV. already described may be tried strictly, as in cases of diabetes without acidosis.

In this sketch of the line of treatment I have carried out in the last few years, I have not referred to many methods which have been recently much discussed and recommended. Also I have not given many details of treatment.[5] I have tried to indicate only, and as briefly as possible, the line of treatment which I have carried out myself and found most useful.

The treatment of diabetes is now much more satisfactory than it was a few years ago, and if carried out carefully and continuously, except in cases with persistent acidosis, and even occasionally in these cases, the results are often excellent. By one of the Diets I., II., III., or IV., or by drug treatment, &c., the glycosuria may often be arrested, at least temporarily, and having been once arrested often it can be kept in check more or less, or kept small for many years, or even in some cases permanently.

NOTE ON A CASE WITH SEVERE GASTRIC CRISES TREATED BY AACHEN METHODS.

BY REGINALD HAYES, L.R.C.P., M.R.C.S. ENG.

IN all cases of syphilis of the nervous system it is eminently advisable that prolonged inunction should be tried. It is best tolerated when given with the sulphur water, internally and externally, as at Aachen. If scrupulous attention be paid to detail in the administration, no ill effects can follow, and it is as a rule well borne. The method in every particular has now for some years been carried out in this country, where the patient has the added advantage of keeping in close touch with his usual medical attendant. The following are the notes of a case kindly referred to me by Mr. Richard Lake.

The patient, a middle-aged man, complained that for some weeks he had suffered, after the slightest exertion, from burning pains in the shins. The condition was getting worse, and he requested me to give him a course of Aachen treatment, as similar trouble in the past had disappeared after a visit to that spa. Having only recently become aware even that any attempt was being made to reproduce the Aachen routine in this country, he was sceptical as to the feasibility of carrying out the exact technique, but was willing to give the time necessary for a thorough trial. He was well nourished. Refused a Wassermann test. Urine normal. Knee, ankle, and wrist reflexes absent. Pupils presented Argyll Robertson phenomenon. Motor: Walked cautiously—slight Rombergism, otherwise normal. Sensory: Areas of anæsthesia existed over trunk and limbs. There was some deficiency in motor power of bladder and rectum.

History.—About 20 years ago he acquired syphilis; rash marked; glands in groin small. Treatment: Hutchinson's pills for six months, when he was pronounced cured and resumed his normal life. He had no further symptoms until the end of 1902 when he found difficulty in singing, choked without any obvious cause, and was troubled with giddiness. In 1903 he tried a holiday for some months, but on his return felt no better, was very depressed, and became unsteady on his legs from time to time, even falling down. He consulted Dr. Risien Russell, who diagnosed tabes and ordered rest in bed and general massage, and inunction of mercury in axilla and groins daily for a few weeks. This, in addition to KI internally, was persevered with for six weeks. The patient felt better, and went away to the country for three months. In May, 1904, he had a series of bad gastric crises, during which he nearly died. Morphia and ether injections and feeding per rectum became necessary. After this he was confined a great deal to bed, and in the intervals could only be said to "crawl about." He was then advised to try inunction at Aachen. Going there in January, 1905, he was placed under the care of a physician there, who confirmed the diagnosis of tabes, and on his advice the patient was submitted to 76 rubbings. Shortly afterwards he had another bad attack of gastric crises and heart failure. Again he nearly died, requiring morphia and ether injections and rectal feeding. He improved, but after 32 more rubbings had a further alarming crisis. In July, still another crisis occurred, necessitating rectal feeding, &c., as before. Subsequently he had at Aachen, in October to November, 50 rubbings: 1906, 2 visits, 60 and 50 rubbings; 1907, 1 visit, 40 rubbings; 1908, 2 visits, 40 rubbings each time; 1909, 1 visit, 40 rubbings; 1910 to 1914 inclusive, an annual visit, 40 rubbings on each occasion. In 1915, no treatment; a Wassermann test done in the winter was negative.

Recently, when he consulted me, the complaint was that he felt he was going back, as shown by burning feelings in the shins after quite a short walk, and a tendency to giddiness after sitting down. I advised 40 rubbings with full Aachen technique. These were carried out at his own house—a plan of great advantage in cases of this type. As his wife had accompanied him during his many visits to Germany there was no necessity for explanation or excuse. A few weeks afterwards his discomfort had gone and he had attained his usual level of health. He expressed surprise that the technique with which he had become so familiar at Aachen could be reproduced in its entirety in London.

This patient paid 13 visits to Aachen and underwent 698 rubbings. It was not until 108 inunctions had been given that definite improvement was noted and the crises ceased. He was never salivated, nor did he suffer from gingivitis. His weight is now normal for his height, and has increased 3 st. since beginning treatment. His capacity for work and play is now considerable.

Cornwall-gardens, S.W.

[5] In my article on Diabetes in the "Encyclopædia Medica," I have given details respecting diet, drugs, mode of life, &c.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ELECTRO-THERAPEUTICS.

New Method of Bullet Extraction.—Heliotherapy and X Rays in the Treatment of Surgical Tuberculosis.

A MEETING of this section was held on April 20th, Dr. G. HARRISON ORTON, the President, being in the chair.

Dr. A. E. BARCLAY (Manchester) communicated through Dr R. KNOX a further note on the New Method of Bullet Extraction, of which he gave a recent description—namely, by a specially designed, electrically connected pair of forceps to which a fluorescent screen was attached. Dr. Barclay said it was difficult, in the stress of war work, to assess the facts, but the instrument, when perfected, performed the extractions well and with but slight damage to the tissues. But there were limitations: (1) It could only be used in the direct line of the X rays; (2) it required experience and knowledge of X ray shadows to perform extractions safely and quickly; (3) the dangers due to prolonged exposures to X rays were not appreciated by many Army X ray workers who had not had experience of X ray therapeutics, hence such an instrument was not a safe one in their hands. Dr. Barclay's own experience with the apparatus had been successful. He did not advocate the use of the apparatus generally in large military hospitals until the times were less strenuous and a proper study could be given to it.

Mr. H. J. GAUVAIN read a communication entitled "Heliotherapy and X rays in the Treatment of Surgical Tuberculosis." He first outlined the modern conception of surgical tuberculosis. The disease was a generalised one with local manifestations requiring very varied methods of treatment. The question of the "soil" of the patient was of great importance, and every endeavour should be made to improve the resistance of the patient, so that his natural defences should be strengthened and fortified, in order to put him in the best position to overcome the disease. Sunlight, he said, acted in two ways: (1) directly on local lesions; and (2) indirectly by inducing favourable constitutional effects and benefiting deep lesions. Direct action was beneficial (1) by the bactericidal effect of ultra-violet light on superficial lesions; and (2) by the inflammatory response which exposure provoked. This inflammatory response must be controlled, as, if unchecked, harmful and necrotic effects would be produced. Evidence was cited to show that the ultra-violet light waves most nearly resembling those found in the solar spectrum were of the greatest value. Shorter waves might be injurious; in any case their beneficial action was not clearly ascertained and the danger of utilising artificial sources of light producing these short-waved rays was indicated. Until more was known of their action they should be filtered off by suitable methods of screening. All the beneficial effects were then obtained without exposing the patient to danger. Exposure should always be carefully graduated. The direct action of ultra-violet radiation was limited to superficial lesions owing to the very small penetrating powers these rays possessed. Their penetration might be increased by rendering the skin anæmic, but even under the most favourable circumstances their penetrating power was not great. The greatest value of heliotherapy was associated with its remote effects, and light treatment for this purpose had not attracted the attention desirable. The remote effects, Mr. Gauvain said, appeared to depend upon the ability of the skin of the exposed patient to pigment adequately. This pigmentation was produced by ultra-violet radiation, but was also dependent upon some factor inherent in the patient and varying widely in degree. Equal exposure in different patients would induce very varying degrees of pigmentation and some patients would not pigment at all. In these the direct effects of light therapy were produced as easily as in pigmenting patients, but the remote effects were unobtainable. Sandy and red-haired patients attacked by tuberculous disease often had little pigmenting power. Their skins would freckle, but would often not pigment except with great difficulty. Freckling was undesirable, as its formation was not associated with any improvement. He had noted that failure to produce pigmentation was often associated with latent tuberculosis, even though there were no clinical signs of active tuberculous disease. Subsequent development and successful treatment of a hitherto unsuspected lesion were frequently associated with acquirement of pigmenting power, which synchronised with rapid improvement, both general and local. This observation was, therefore, of great prognostic value and corresponded to a somewhat remarkable extent with observations made on the prognostic significance of the von Pirquet reaction. Mr. Gauvain submitted a theory that the action of sunlight on man was to some extent on parallel lines with its action on plant life. In green plants, the actinic rays stimulated growth, but it was the illuminating rays which, viâ the transforming medium of the chlorophyll pigment, effected assimilation. In man, while the ultra-violet rays induced pigment formation, it was probable that the remote benefits produced by sun treatment might be largely ascribed to the illuminating rays acting through the medium of the pigment. There was much clinical evidence to support this, and he had designed experiments which, it was hoped, would further elucidate this important question. It was well known that the long-waved rays had very great penetrative power, but in the absence of pigmentation they appeared to have little influence on surgical tuberculosis. The physiological properties of these rays demanded careful investigation. Pigmentation had an important protective rôle. Once established prolonged exposure could be tolerated. Pigmented patients suffered little from excessive heat or cold. The effects of light treatment on pigmented patients were discussed. The author considered that insolation should be regarded as an adjuvant method of treatment which accelerated and consolidated the cure. It increased the patient's power of resistance. It had a very marked tonic and pyschological effect. It speeded up metabolic activity. Oxygenation was increased but the respiration rate diminished, though the amplitude of individual respirations was greater. There was increased elimination which was of value in the discharge of toxic products. The effect on the blood stream was profound and increased formation of red cells, increasing hæmoglobin and leucocytosis had all been noted. On even the deepest lesions marked improvement had been recorded. Sinuses frequently dried up where other methods of healing failed. Sequestra were often painlessly extruded. The resulting cicatrices were often almost invisible and keloidal scars almost unknown. Fibrous tissue generally when not needed was absorbed, and this property was of a special value in restoring mobility to healed joint lesions long fixed by fibrous ankylosis. Viewed as a whole, patients did much better in the summer when exposed to sun treatment than in the winter. In the after-care of patients occasional courses of insolation should be prescribed. Heliotherapy was undoubtedly of great benefit in consolidating a cure and reducing the danger of a relapse. Heliotherapy in surgical tuberculosis was, in the speaker's opinion, contra-indicated: (*a*) for the remote effects in patients who have no pigmenting power; (*b*) in amyloid disease; (*c*) in certain acutely septic cases until improvement by other means has been first effected. The indications for X ray treatment in surgical tuberculosis were next considered. The importance of careful technique and selection of suitable cases was emphasised. Iselin's table of tolerance was always observed. The author summarised his observations as follows: (1) X ray treatment was of great help in certain local conditions, and synchronous with their amelioration general improvement is often maintained; (2) its value and applicability varied in different regions of the body; (3) it was useful in certain cases of sinus formation and in the treatment of many tuberculous ulcers, leaving supple, non-keloidal scars; (4) it was especially valuable in certain cases of tuberculous adenitis, but the greatest benefit might usually be only anticipated if associated with other methods of treatment, and it was particularly useful where there was much periglandular infiltration and here formed a useful treatment preliminary to extirpation or aspiration, aspiration together with the use of modifying fluids to be preferred to extirpation, when possible; (5) it was most safely applied in tuberculosis occurring in the neck, elbow-joint, and knee-joint; (6) it was apparently helpful in certain cases of caseous abscess formation; (7) it was both unnecessary and undesirable in the treatment of abscesses which can be easily aspirated, and should not be used with abscesses which leak from an aspiration puncture which has resulted from faulty technique; (8) it was dangerous in abdominal tuberculosis and apparently of little value in costal tuberculosis; (9) possible untoward effects as the result of careless technique or too frequent exposure should always be borne in mind and guarded against; and (10) while of great assistance in the treatment of specific lesions, other aids to treatment were often required and should be associated. The paper was illustrated by numerous lantern slides and autochromes, one of the latter demonstrating the extrusion of sequestra during insolation.

A discussion followed.

BRITISH SCIENCE GUILD.—The eleventh annual meeting will be held at the Mansion House on Monday next, April 30th, at 4 P.M., when Lord Sydenham will give an address on National Reconstruction.

TAVISTOCK (DEVON) URBAN COUNCIL AND "MEDICAL ETIQUETTE."—At the last meeting of the Tavistock Urban Council a letter was read from the Local Government Board in reference to the free distribution of disinfectants. The medical officer of health said he was afraid that no disinfectants would be forthcoming for the poor residents of Tavistock, because the medical officer of health was required to have a note from the medical attendant stating that a disinfectant was required, and the medical men in the town "did not, and would not, give these notes"; he added that he doubted whether any other urban district demanded these notes. A member remarked that it was some "imaginary question of medical etiquette," and he proposed that the council inform the medical practitioners of Tavistock that these notes should be adopted, and this course of action was decided upon.

Reviews and Notices of Books.

Military Surgery. By DUNLAP PEARCE PENHALLOW, S.B., M.D. Harvard, Chief Surgeon, American Women's War Hospital, Paignton, England; Captain, Medical Corps, Massachusetts National Guard; &c. With an Introduction by Sir ALFRED KEOGH, K.C.B., Director-General, Army Medical Service. With original drawings by the Author. London: Henry Frowde and Hodder and Stoughton. 1916. Pp. 432. Price 15*s.* net.

THE advent of the war has introduced many a surgeon, hitherto accustomed only to the injuries encountered in civil practice, to conditions almost unknown to him, not only in degree but in kind. The variety and severity of the lesions produced in the present conflict have never been equalled in previous wars. Fresh problems have presented themselves, at the solution of which hundreds of surgeons are working, many of them under difficulties inherent to war conditions, and there is little surprising in the fact that they have not all come to the same conclusions. Unanimity under such conditions would not be a sign of healthy progress.

We therefore owe a debt to those surgeons who, possessing a wide experience of the surgery of war, give the results of their labours to the world. Dr. Penhallow's position as chief surgeon to the American Women's Hospital in this country has given him ample opportunities of forming considered opinions, and in the volume before us he has recorded his conclusions regarding the best methods of treating wounds met with in the present war.

The work is fully illustrated with drawings, photographs, and skiagrams, and the descriptions of treatment are sufficiently detailed to enable those with but little experience to follow them. The varieties of projectiles are described; the infection of wounds is discussed in one chapter, gunshot wounds of soft parts are dealt with, and in other chapters the treatment of wounds of special structures, such as bones, joints, nerves, and blood-vessels; such conditions as shell shock, gas poisoning, and trench foot also are considered.

The importance of his views is much increased by the impression which the reader gains from Dr. Penhallow's book of an extensive acquaintance with the writings of others in this domain of surgery, and of familiarity with the literature of the surgery of the wars of the past. And this is well since on nearly every page matters arise in which there is room for discussion, and it will hardly be until the war is over, if then, that surgeons will be in a position to state with certainty what is the best practice to follow. No surgeon at present sees the whole of the treatment of any long case; he may see it at an emergency clearing station or at a base hospital, or it may come under his care at a hospital in this country, but he will not see it from start to finish unless its course is brief indeed. Time alone will give a clearer vision of what is the best treatment in prolonged and difficult cases.

Dr. Penhallow's book may be regarded as a serious contribution to this clearer vision, and it will prove of special value to the less experienced military surgeon, who will find it a trustworthy guide in carrying out his duties.

Stati Ansiosi nelle Malattie Mentali. By Dr. GASPARE BERGONZOLI, Superintendent of the Provincial Asylum at Pavia. Voghera: Via Cavour 12. Pp. 186.—In every epoch and from very remote times the symptom-group of anxiety and grief has been noticed in various organic and psychical maladies, particularly in those where, by its frequency and importance, it presents itself in a striking fashion. The author, therefore, in this monograph draws attention to those forms of psychosis where anxiety occupies the principal part in the clinical picture of the disease so as to constitute a special variety, or other forms in which it constitutes an important symptom, yet without changing materially the physiognomy of the psychosis. After a brief historical review, the author describes a typical condition of "pantophobia" accompanied by symptoms of organic disturbance, of sensation, the circulatory and respiratory systems, &c., and then sketches phenomena of anxiety in organic diseases and psychoneurosis. The bulk of the work, however, consists in a careful and elaborate description of "anxiety psychosis" in its various aspects and conditions of depression and obsession, followed by a chapter in which nine cases are portrayed with full clinical details. The etiology and pathology of the condition are then discussed, and a separate chapter is devoted to its diagnosis, prognosis, and treatment, the author having obtained the best results from the administration of opium. In an extensive bibliography of 356 items we only notice the names of Arnold, G. Beard, Crichton, Robertson, S. T. Rucker, and Arthur Townsend among British and American observers, but the monograph is very complete and may be considered to be the last word on anxiety neurosis at the hands of our distinguished Italian colleague.

Text-book of Meat Hygiene. By RICHARD EDELMANN, Ph.D. Third revised edition and authorised translation revised for America by JOHN R. MOHLER, A.M., V.M.D.; and ADOLPH EICHHORN, D.V.S. With 161 illustrations and five coloured plates. London: J. and A. Churchill. 1916. Pp. 452. Price 21*s.* net.—This third English edition of a well-known work has been revised in several important directions. Previously abundant references to German conditions, especially on the subject of the disposition of diseased animals, have now been replaced by exclusive reference to the rules and regulations governing the meat inspection of the United States Bureau of Animal Industry. Further, since the publication of the second edition, reviewed in our columns of March 29th, 1913, alterations have been made in the regulations made by the United States, and the new régime forms an important portion of the subject-matter of this edition. The new orders refer chiefly to the disposition of carcasses and to the recent measures of control adopted over the importation of meat. The advanced attitude of a country like the United States in the important matter of meat hygiene is well worth studying, and apart from the practical chapters, which are of direct interest to the meat inspector, this book may safely be taken to represent modern views upon the whole subject.

Elementary Qualitative Analysis. By BENTON DALES, Ph.D., and OSCAR LEONARD BARNEBEY, Ph.D. New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd. 1916. Pp. 205. Price 5*s.* 6*d.* net.—Laboratory guides in qualitative analysis are fairly numerous, and it is only occasionally that an author is found to introduce any novel features. This work presents, however, a few important departures which may justify its appearance. The introductory chapters on the principles underlying qualitative analysis give a clear account of chemical changes, precipitation, the evolution of gases, and the like interpreted in the light of modern knowledge. Dissociation into ions, reversible reactions, and the laws of equilibrium are discussed in a clear manner. Coming to the group system, a new scheme is given for the detection of acids which facilitates this process, and the authors prefer to discover the acids first, as then, rightly enough, "the procedure for the bases can usually be abbreviated." The book reveals an experience of qualitative testing, coupled with a systematic presentation of facts, which should help to put the student in right paths.

Text-book of Elementary Chemistry. By F. MOLLWO PERKIN, Ph.D., F.I.C., F.C.S.; and ELEANOR M. JAGGERS. London: Constable and Co., Limited. 1916. Pp. 384. Price 3*s.* 6*d.* net.—Chemistry in its applications to some of life's affairs is illustrated in simple terms in this book. Only familiar things such as the air, water, chalk, sulphur, and certain metals are dealt with, but at the end of the story there appears a chapter on technical processes, illustrating the chemical principles underlying the manufacture of well-known commercial products, as the aniline dyes, soap, glycerine, oils, and so forth. It is doubtful whether the section on vegetable oils and animal fats will be clearly understood by the general reader when he has to face such terms as "monobasic" "glycerides" and "hydroxyls." There is a curious slip on p. 166, where the authors state that "water is temporarily hard when boiling will not alter its hardness." On p. 158 the student is asked to blow gently into a flask in which the loss of carbonic acid gas, by evolution from a carbonate, is being determined; it would clearly be more accurate to withdraw the residual carbonic acid gas by sucking it out, since the breath would deposit moisture, and so to an extent disturb the calculation. The educational aim of the book is praiseworthy.

THE LANCET.

LONDON: SATURDAY, APRIL 28, 1917.

The Calling Up of Medical Men of Military Age.

THE attacks made by German submarines upon our hospital ships have determined the Government to take a step which as a matter of course must have been present to their minds for some time. It has been decided to call up every medical man of military age, and every practitioner in this category will become available for the Army by May 6th. The fact that the Germans had attacked relentlessly our hospital ships during the past fortnight was announced by Mr. BONAR LAW in the House of Commons last week; before the official statement, tragedies of the kind to which he alluded had received public announcement, and in the interval others have occurred with a sad loss of medical personnel. The torpedoing of the hospital ships made clear the necessity of establishing a large number of new hospitals overseas, so that the provision abroad of the suitable hospital personnel should enable the number of wounded returned home to be sensibly decreased. Accordingly, Lord DERBY has issued a letter from the War Office to the medical practitioners of the country explaining the situation clearly, and indicating that the extensive withdrawal from their practices in the country of medical men of military age must be answered by all who remain with offers to act in a general scheme of substitution, whereby the gaps in the home medical service may be filled as completely as is feasible.

The decision of the Government to call up medical men of military age will not come as any surprise to our readers, who have been kept aware of the direction which events were taking. It has for some time been obvious that the demands of the War Office, which must be taken to be identical with those of the Army, for more medical officers could only with difficulty be met under any voluntary system. Under that system the country has received, and is receiving, the devoted assistance of thousands of medical men who have neither given heed to their financial present or their professional future, nor to the personal dangers of the medical soldier, as revealed in the ever-growing lists of our dead and wounded colleagues. The Central Medical War Committee, the Scottish Medical Service Emergency Committee, and the Committee of Reference of the English Royal Colleges have all worked unceasingly to supply the War Office with medical officers, while watching over the interests of the civilian community at home, on whose maintained good health so much of our efficient conduct of the war necessarily depends. A large number of Local Medical War Committees have coöperated with the central bodies in recommending which of the practitioners in their localities should be taken and which should be left, and their opinions, often given in difficult and delicate situations, have, on occasion, been carefully revised by the central bodies, no pains being spared to balance the *pros* and *cons* and elicit the deciding factor in every instance. The deliberations of the Central Medical War Committee have been strengthened throughout by intimate relations with the Local Government Board and the National Insurance Commission so that individual exemptions of medical men by the statutory tribunal have been considered both on their own merits and in respect of any public claims. The result of all this hard and careful work, carried on from day to day over a period of 20 months, had begun to suggest that the voluntary reply of the medical profession had been given in entirety, and that further demands upon the practitioners of the country to take commissions would have to be based upon a scheme of general calling up of all those of military age, combined, it might well be, with modifications in the employment of medical officers whereby economy of material would be ensured. Just when affairs had reached this position came the unspeakable onslaughts by the German submarines upon the Red Cross ships, and the decision of the War Cabinet to call up at once under the Military Service Acts all medical men of military age followed immediately. Lord DERBY'S circular letter, which we print elsewhere, conveys the information to the medical profession in complimentary terms.

The onus of responsibility is now removed from all medical men of military age; they are called up, however, as a class and not as indistinctive citizens, and recent events have confirmed their central professional war committees in the resolve only to continue selecting doctors for military service if they are allowed to retain the decision how many and which individuals can be spared from civil work. To medical men above military age voluntary discretion remains, but in Lord DERBY'S letter the hope is expressed "that every doctor over military age will immediately offer his services to the Local Medical War Committee of his area as willing to undertake any substitution work within his capacity which would help to release any man of military age who cannot otherwise be spared." Acceptance of this invitation will be easy for some men and extremely difficult for others, the considerations ranging themselves under such headings as age, health, locality, and equipment, and requiring no further analysis to make their force apparent to medical readers. We trust earnestly, and we believe, that those whom the call to substituted service finds in positions where response has less difficulty, will coöperate quickly with the Local Medical War Committees as to the effective utilisation of their services. It is said of all voluntary systems that the willing men are those who make the greatest sacrifices, and with this our profession, which has borne so much during the war, must not be reproached. There is need for promptitude in the giving in of names at the local centres, for the organisation of the measures possible for maintaining essential medical services, while meeting the demands of the Army, cannot be of a simple nature. Every hour will probably be of value.

The Surgery of the Abdomen: The Lessons of War.

IN civil practice the surgery of the abdomen is of recent growth. It is well to remind ourselves of the time, not many decades ago, and therefore still within the memory of a large proportion of medical men in this country, when even the most experienced surgeon hesitated to open the abdominal cavity. Reference to text-books of surgery of 30 years ago will show that the surgeon then felt justified in washing and replacing a piece of bowel or other viscus protruding through an abdominal wound, or in tying the pedicle of a prolapsed spleen, but he did not venture to open the abdomen to examine the injury caused by accident or bullet. A generation has changed all that. The well-founded respect of the surgeon for the peritoneum has given place to the conviction that however great the risk he runs of setting up a septic peritonitis in opening the abdominal cavity, the risk is as nothing compared with the danger of leaving untouched a perforated viscus. The danger of infection from without is, under these circumstances, quite overshadowed by the danger of defilement from within, and the only course open to him is to explore the abdominal cavity and to close the wound in the viscus in order to limit the spread of the peritonitis which may already have started. If this is true in civil practice it applies doubly to wounds in war, where the abdominal injuries are far more numerous and usually more severe. The Lettsomian lectures on War Surgery of the Abdomen delivered by Colonel CUTHBERT WALLACE, consulting surgeon to the Army Medical Service, the concluding lecture of which appears in our present issue, and the analysis of abdominal surgery at a clearing station by Captain GERALD S. HUGHES, R.A.M.C., and Captain W. A. REES, R.A.M.C., record experience in dealing with the peritoneum resulting from many months' work in France. The value of these papers to the surgeon rests on the fact that the opinions expressed are based on large experience and reasoned analysis of results.

Under war conditions the precise nature of the fighting materially affects the methods of surgical treatment. Success in the treatment of abdominal wounds depends principally on the ability to operate before much time has elapsed after infliction of the injury. This condition is only granted when the hospital is within a short distance of the fighting line. Such proximity has been possible during the fighting in France ever since the rapid retreat and the advance of the first two months were succeeded by a fighting front remaining practically fixed, with the result that casualty clearing stations become as well suited for abdominal operations as any base hospital. Rushes of work there have been from time to time, and these are now occurring in several places on our front, but the pressure has in general not been such as to prevent the surgeon at the clearing station from performing abdominal section in all desirable cases. When advance becomes more rapid conditions will change: clearing stations will not be so close to the firing line, a longer time will elapse before the patients reach the hospital, while the pressure of work will diminish the time which can be devoted to each case. We may be sure that the utmost will be done to remedy these drawbacks; but clearly the statistics of a casualty clearing station in a fixed position and not overworked must compare favourably with another which is always on the move and almost overwhelmed with the number of urgent cases. The results obtained at the base hospital will vary, but in a different way: the base hospital receives those cases which have survived the shock of the injury and after elimination of all the more severe cases, for these will be already dead.

A perusal of the papers referred to leads to certain provisional conclusions. In the first place, it is clear that all abdominal cases, unless obviously moribund, should receive operative treatment, and this at the earliest possible moment after injury, provided that extreme shock is not present. Performance of abdominal section during severe shock can only serve to impair the little chance of life remaining to a wounded man. Within half an hour warmth usually removes much of the shock in all but the most severe cases, and the abdominal section can then be undertaken. Secondly, the operation itself must be performed with the utmost despatch, and the abdominal contents not brought out of the wound more than absolutely necessary. Large incisions are therefore indicated. The less the bowel is manipulated the better, but examination for perforations must be thorough, omitting no part of the abdominal contents where a wound is likely to be present. The recorded experience shows further that abdominal sections can be done when many of the arrangements provided in a civilian hospital are absent. It will, we think, still be possible, therefore, in the future, when the casualty clearing station is constantly on the move, for the abdomen to be opened whenever there is a clear hope of saving life by rapid operation. In this connexion the use of motor ambulances has helped by shortening greatly the time intervening between the infliction of the wound and the arrival of the patient in hospital. We have good reason to be proud of the abdominal surgery done in the casualty clearing stations, and feel assured that the work will be equally well done under the altering conditions.

THE Medical Research Committee understand that, owing to unavoidable delay at the printing offices, copies of the report upon soldiers returned as cases of "Disordered Action of the Heart" (D.A.H.) or "Valvular Disease of the Heart" (V.D.H.) have not been readily obtainable from H.M. Stationery Office. Copies are now, however, obtainable through any bookseller from H.M. Stationery Office, Kingsway, W.C. 2, at the price of 1s.

THE ADMISSION OF DEAF CANDIDATES TO THE C.M.B. EXAMINATION.—At a recent meeting of the Central Midwives Board a letter was considered from the lady superintendent of the Plaistow Maternity Charity inquiring whether a woman who was quite deaf, but was capable of understanding conversation by means of lip-reading, was eligible for admission to the Board's examination. The Board directed that the lady superintendent of the Plaistow Maternity Charity be informed that the woman about whom she inquired could not be admitted to the examination.

Annotations.

"Ne quid nimis."

THE NATIONAL FOOD-SUPPLY.

ACCORDING to the report of the Food Committee of the Royal Society, the consumption of bread in pre-war times by the population of the United Kingdom was 5¼ lb. per head per week. The Devonport allowance of 4 lb. represents a reduction of nearly 25 per cent. upon our previous habit. The reduction of 1–1¼ lb. of bread per head per week asked for by Lord Devonport should make no excessive demand upon the national self-control. We must, however, remember that physiology teaches that a further reduction in the national bread consumption will be dangerous, and the Government must strain every nerve to ensure that the bread-supply, *including all cereals*, is kept up to three-fourths of its pre-war value. The voluntary ration of bread and meat officially recommended to the nation by the Ministry of Food Control has now stood the test of ten weeks' trial, and the possibilities of the Devonport figures are generally recognised. If these figures—4 lb. bread and 2½ lb. of meat per head per week—are taken to represent distribution figures for the whole mixed population of men, women, and children, workers and non-workers counting alike as heads of the population, no apprehension need be felt as to keeping up the man-power of the nation, but to limit the worker to the 4 lb. bread ration must imperil his value. The German experience proves that some time may elapse before this happens, but the risk is one that should be avoided. Bread, by which all cereals as food is implied, is the worker's food which nothing can replace. The economy of bread is necessary by worker and non-worker alike in so far as our customary waste of bread must cease. It is imperative on all the sedentary classes in this country to get as far below the bread ration of the Ministry of Food Control as possible, for in this way the expiration of time at which the worker can return to the full bread ration will be assisted. The consumption of other cereals than wheat by those who can dispense with them is no true national economy. It should be, and probably is, the intention of the Government to make some statement on this vitally important matter to the public as soon as an accurate forecast can be arrived at as to the amount of cereals we have in hand. The country would also like to learn the views of the Royal Society, expressed through their Food Committee, for an authoritative statement would be very useful. Lord Devonport's statement in the House of Lords on Wednesday is satisfactory as indicating that the term of privation which should *now* begin will not last until the period of danger for our manhood efficiency.

KORSAKOW'S SYNDROME.

IN another column we publish a communication by Dr. Hildred Carlill, attached as neurologist to the Royal Naval Hospital at Haslar, on a case of Korsakow's psychosis in association with malaria, which draws attention to a curious and not yet fully understood condition. Mental symptoms associated with peripheral neuritis were often recorded by clinical investigators, notably by Dr. Allen Starr, of New York, before Korsakow, in 1887, described a syndrome subsequently called by his name on the suggestion of the late Professor Jolly, of Berlin. Korsakow's own title for it was "cerebropathia psychica toxæmica"—a cumbersome and not very informative term. It indicated, however, the toxic nature of the condition, which, as first described, was supposed to be characteristic of disturbance of the central nervous system of alcoholic origin, linked, in fact, to an actual and obvious peripheral neuritis. Hence it has been regarded by some as the expression, clinically, of a "central neuritis," and this, pathologically speaking, is probably not incorrect. Many cases have since been reported of Korsakow's syndrome apart from alcohol, and, indeed, apart from any evidence of polyneuritis. Oppenheim in one case could find no other cause for the symptoms than a continued use of pyramidon. Further, in not a few cases of alcoholism the mental picture is not comparable in any way to that of Korsakow's "polyneuritic psychosis." Dr. Carlill mentions its occurrence in typhoid fever, diabetes, arsenical poisoning, and malaria; almost any toxic or toxi-infective state may be supposed, in the presence of certain at present unknown factors, to bring it on. As the type of psychosis is, as a rule, peculiarly definite and clear-cut, its appearance in the course of widely differing toxæmias is one of the most interesting features of the condition. The megalomania of dementia paralytica is not more precise than the amnesia, paramnesia, and confabulation of Korsakow's symptom-complex. In the foreground of the clinical picture is the patient's Unmerkfähigkeit—his incapacity for retaining recent impressions. His retention of memories of recent events is incredibly fleeting: in a minute or less, sometimes, they have vanished. Arising in a sense from this, and no less characteristic, is the patient's confabulation or romancing, and he is often curiously euphoric or good-humoured in relating his fanciful tales. Hence, also, his illusions of memory and illusions of recognition—so-called paramnesia. He will believe that he has been out for a walk when he has never left his bed, and will proceed to describe with charming verisimilitude whom he met and what he saw during his constitutional. It is obvious, further, that another feature of his mental state is suggestibility; not only does he invent himself, but he believes the most improbable stories foisted on him by the observer. His judgment is badly at fault and his critical faculty in abeyance. Disorientation and confusion of recent and remote events, and absurd attempts to fill memory gaps and hiatuses, are well illustrated in the case recorded by Dr. Carlill. It has already been observed that polyneuritis is a frequent but not an integral part of the syndrome. Persistently absent Achillis-jerks may well represent an old neuritis; were they the expression of a recent neuritis probably other symptoms would be present with them, but these Dr. Carlill on repeated examination has failed to discover. Hence, the case is of interest also in suggesting either that the mental state has outlasted the neuritis or that it has occurred separately. When the clinician is faced with a well-defined and circumscribed mental syndrome in the course of an essentially diffuse and unsystematised disease such as a general toxæmia he is justified in asking whether he is dealing with a specific action of the toxin on a certain part or parts of the cerebral cortex. The underlying pathological basis of general paralysis is a diffuse and irregularly massed meningo-encephalitis, yet the

expansive ideas of the general paralytic are *sui generis*. Similarly paramnesia and confabulation form a symptom-complex of sufficient definiteness to be readily recognisable, and they occur typically in the course of alcoholic invasion of the nervous system, diffused throughout as we know that invasion must be. It can be no mere guess to suppose affinities between certain toxins and certain cerebral layers or groups of cells differing in physical properties; at the least we are compelled to imagine specific interactions between toxins and the chemical activities underlying the function of neuronic systems. We may adopt Pick's view and regard the cortex as a mosaic anatomically and physiologically, and patiently dissect from mental symptomatology such separable groups of symptoms as, occurring in the same form and under analogous pathological influences, may lead us to assume that certain neurons are more vulnerable than others, and that their impairment expresses itself clinically always in the same fashion. Disorder—perhaps associational—of these neurons gives a clinical picture as definite as that produced by disorder of any of the projection-systems, which all recognise and on the definiteness of which the study of neurology is based. Assent to the contention that the cerebral mechanism functions as a whole is no reason for ignoring evidence which may afford an insight into the ordered working of its component parts.

A NEW ROMAN OCULIST'S SEAL.

RENEWED interest has recently been taken in the oculist seals of the ancient Roman specialists and we have again to record the discovery of a new signet. This was found near Cologne in 1888, but was immediately lost, and only quite recently came to light again. Its owner's name, which, as usual, appears four times on the stamp, was Tiberius Julius Jasonis, and the nomina suggest that the seal dates from early imperial times. The text is as follows: "Tib Juli Jasonis: herodes" (euodes) "ad Aspritudines et Cicatrices et cœnum. Diaglaucium ad Impetum Secundum in v(eteribus?) c(oti).....bur ad Aspritudines et cicatrices to (tollendas) Aliso ad Impetum et quaecunque desi....." The incomplete final letters suggest, perhaps, desicco or desino. The first remedy, Euodes, merely means perfume, and has been found upon only a few of these seals. Of what its ingredients consisted we have no knowledge. It occurs upon the seal found at Tranent, in Scotland, and described by Sir J. Simpson in the *Monthly Journal of Medical Science* for 1851. The reading upon that relic contains the practically identical sentence, "Euodes ad cicatrices et aspritudines." Its occurrence upon these seals, usually without advising its mixture with any other collyrium, tends to show that it possessed some medicinal properties. It is also so advised upon a seal found at Ratisbon. Euodes is stated upon a seal, which before the war was in the Lille Museum, to be a cure for genas retortas, words that are a philological crux. According to a signet found at Bourges it was to be mixed with opobalsamatum, and here again as contra aspritudines—i.e., the palpebral granulations of ophthalmia. The cicatrices referred to may be either those of the transparent cornea, an affection which Galen describes thus—"Cicatrix appellatur (exulceratio totas membranas dividens) ubi nigro oculi exalto ulceré membrane crassities supervenit, et color albior apparet"; or they may be those of the eyelids or eye sockets, as one seal mentions genarum cicatrices, with which may be compared Ovid's expression—exspoliatque genas oculis. Celsus advises various collyria, according to whether the cicatrices were cavæ or crassæ. For the first case he prescribed Sphaerion, whose value he says was recognised by Asclepius himself. Diaglaucium is seldom mentioned upon oculist stamps, and it is uncertain what it was—probably poppy juice. Impetum designates the violence of the primal attack of ophthalmia before appearance of the mucous secretion. Secundum is a word like the phrase post impetum given upon many seals; it signifies the period when the first severe effects were declining. The lacuna in the text for which (c)oti...bur is suggested by the first editor of this seal is not easily filled up. Also the meaning of the word, or part of a word, Aliso is at present obscure.

A POSSIBLE DRAWBACK OF HIGH-TITRE ANTITOXIC SERUM.

WHATEVER may be the exact chemical nature of antitoxin, there is no doubt that it is intimately bound to the globulin molecules of the serum which contains it. The foreign protein of the antitoxic serums injected into the human patient for the treatment of tetanus and diphtheria is rapidly destroyed in the body, and the more quickly the smaller the quantity injected. The attached antitoxin is probably destroyed at the same time, and the question therefore arises whether it is advisable to aim at using small quantities of serum as is done in the modern high-titre brands. In the *Wien. klin. Wochenschr.* (1916, p. 37), T. Hamburger called attention to cases of tetanus and diphtheria which did well until the fifth or seventh day of treatment and then suddenly took a turn for the worse, ascribing the occurrence to the destruction by that time of the horse protein, and with it of the antitoxin. He suggested the advisability of using a larger quantity of lower-titre serum or of adding a large amount of normal horse serum at the moment of injecting. Professor Spronck, director of the Pathological Institute at Utrecht (ibid., 1917, p. 332), has followed up the question further, confirming Hamburger's suggestion by actual experiment. Using antitetanus serum with the mouse as a test-object, Spronck found that the blood serum of a goat which received 40 units contained in 40 c.c. of serum was more antitoxic ten days after the injection than the serum of a goat which had received twice the number of units in half the amount of excipient. The goat apparently destroyed 14 c.c. of horse serum, and with it the attached antitoxin, in ten days. Further experiments confirmed the result. Spronck concludes that the views of Hamburger are correct and that it is preferable to use low-titre antitoxic serum in tetanus. While there may be general agreement with this conclusion in theory, in military practice it would scarcely be feasible. For prophylaxis in bulk, at the front, the small quantity—3 to 4 c.c.—of serum of moderate titre now used has great practical advantages and appears to be efficient. Large doses of low-titre serum, besides troublesome to give, would add to the inconvenience and pain of the wounded. For therapeutic use, whether intrathecal or intravenous, the highest titre available is required. A further point in connexion with

the use of alien serum is of some theoretical interest. When prophylactic doses are administered at weekly intervals, the antibody formation against the alien serum is much enhanced, with the result that a progressively increasing destruction of antitoxin occurs, and the protection conferred lasts a shorter and shorter time at each injection. There is much still to be learned in the administration of antitoxin.

SNAPPING HIP.

IN the year 1859 Perrin showed the members of the Parisian Surgical Society a case in which he diagnosed recurrent dislocation of the right hip-joint in a man aged 22 who had injured the joint 12 years previously. This dislocation could be produced by the patient at will by forcible adduction of the right leg, and was accompanied by a loud snapping sound and a visible jerk; reduction of the dislocation took place spontaneously. Thus Perrin; but other members of the society held other views. A committee to investigate the matter was appointed and reported to the effect that no dislocation took place, and referred the snapping sound to a movement of muscle-tissue over the great trochanter. Chassaignac, one of the members of the committee, specified the tensor fasciæ latæ as the muscle here concerned; while Morel-Lavallée, another of the members, specified the anterior fibres of the glutæus maximus. No further instance of the condition appears to have been recorded until 1900, when Wertheim Salomonsen described two examples as "hysterical deformity of the hip with scoliosis." The patients, a man and a girl, seem to have had each a single "dislocation" of the hip and to have recovered from it suddenly with a loud snapping sound. Wertheim Salomonsen diagnosed a "physiological dislocation of the hip," rejecting the view (as Perrin had done) that the condition was due to tension of fibres of the glutæus maximus pressing the great trochanter out of place. In 1905 Ferraton described in detail a similar case, under the name "hanche à ressort," or "spring hip," in which the snapping was audible, visible, and palpable. In 1911 Heuilly was able to collect 57 cases of snapping hip, or Perrin-Ferraton's disease, from the literature. It appears, however, that not all the instances of snapping hip are as straightforward as those described above. Dr. G. Kapsenberg proposes[1] to distinguish two classes of the disease, the typical and the atypical. In the typical cases the cause of the snap lies at the level of the great trochanter; "something" slips over this bony prominence, and this "something" consists, behind, of fibres of the glutæus maximus, in front, of fibres of the tensor fasciæ latæ, and in its middle part of the converging descending fibrous cristo-femoral tract which forms the ilio-tibial band. The whole is called the "hip-deltoid" by Dr. Kapsenberg, and is compared to the deltoid muscle of the shoulder-joint. The distinction of the cristo-femoral (Zur Verth) or fascio-gluteal (Heuilly) tract from the ilio-tibial band is described as functional rather than anatomical. In some people the typical snapping of the hip can be produced at will, particularly if the glutæus maximus is kept out of action, the cristo-femoral band then slipping forwards in front of the great trochanter harmlessly and without pain. But in other instances the snapping is produced involuntarily, and is both disabling and painful; this state of affairs is promoted by any morbid process about the hip that either shortens the cristo-femoral tract and so increases its tension, or weakens the glutæus maximus muscle, or increases the prominence of the great trochanter. As for the atypical cases of snapping hip, these are rarer, and Dr. Kapsenberg defines them as those in which the snap is not produced at the level of the great trochanter but somewhere else. He thinks it unlikely that a subluxation of the hip-joint accounts for any of the instances, and gives details of a case of his own in which the snap was produced near the anterior superior iliac spine. Under local anæsthesia the tissues were dissected in this region, and with the coöperation of the patient it was proved that the snapping band of tissue was a tendinous part of the ilio-psoas muscle, in all probability the so-called third head of it that springs from the anterior inferior iliac spine and passes obliquely across the head of the femur to gain its insertion into the lesser trochanter. The head of the femur at this point was thought to be abnormally prominent, though no definite bony outgrowth was made out, and when the patient flexed the hip the overlying tendinous part of the ilio-psoas muscle slipped from it sideways and outwards with a loud and palpable snap. Conversely, when the patient once more extended the flexed leg, the sharp edge of the head of the femur held up the tendinous band under increasing tension until, as a smoother part of the bone came to underlie the band, it slipped back medial-wards with a violent snap and shock. Dr. Kapsenberg divided this band; the wound was sewn up and healed by first intention, and the patient's hip no longer could be made to snap.

[1] Nederl. Tijdschr. v. Geneeskunde, Amsterdam, 1916, II., 1849.

THE Croonian Lecture of the Royal Society will be delivered on May 3rd by Dr. Thomas Lewis, the subject being "The Excitation Wave in the Heart."

THE CONTROL OF VENEREAL DISEASES.

Council Schemes.

THE draft scheme for the *City of Bristol* recently submitted to the Local Government Board provides for the clinical work of the venereal treatment centres to be undertaken jointly by the Bristol Royal Infirmary and the Bristol General Hospital, and for the pathological work to be carried out at the laboratory of the University of Bristol under the professor of pathology.

Dr. F. H. Morison, county medical officer of health, has submitted to the *Cumberland County Council* a suggested scheme for the diagnosis and treatment of venereal diseases in the county. In order to obtain some idea of their prevalence Dr. Morison sent a circular letter to each medical practitioner in the county asking him how many cases of venereal diseases he treated in a year. He says:

> A large majority were good enough to reply to my letter, but several did not, and so even these figures are incomplete. The figures I obtained are as follows:—Number of cases of syphilis, 479; gonorrhœa, 537; soft chancre, 131; total, 1147. It is generally agreed that in any community gonorrhœa is at least three times as prevalent as syphilis, but it will be noted in the figures given for this county that there are only 58 more cases in an average year. There can be no doubt that a large number of cases of gonorrhœa, and many cases of syphilis as well, in poor persons, go to chemists, herbalists, and quacks for treatment. In the case of gonorrhœa I think it is no exaggeration to say that 70 per cent. of the cases go to a quack in the first place.

With regard to the provision of laboratory facilities, no laboratory exists in the county where the work could be done except that in connexion with the County Health Department. Dr. Morison proposes, therefore, to ask the Durham University College of Medicine, Newcastle-on-Tyne, to give the same facilities as have been offered to

the county councils of Northumberland and Durham. He hopes to arrange for beds and out-patient centres at Carlisle and Whitehaven, noting that the authorities of Workington Infirmary and of Penrith and Keswick Cottage Hospitals were unable to offer facilities. In view of the desirability of having a woman doctor to treat cases in females and believing that at present there is no woman doctor in the county, he suggests the appointment of a woman on the staff of the county medical officer. Dr. Morison regards the cöoperation of the general practitioner as essential to the success of the scheme and suggests that representatives of all branches of the profession in the county should be asked to attend the committee meetings. In his summary of expenditure he allows for the treatment of at least 500 cases of gonorrhœa per annum and fixes the total between £1800 and £2200 for the first year.

The scheme submitted by the *County Borough of Bournemouth* for the approval of the Local Government Board contains, amongst others, the following recommendations by Dr. A. D. Edwards, the medical officer of health :—

Laboratory facilities.—That arrangements be made with the Hants county authority for the examination at the Winchester Laboratory of blood specimens by the Wassermann test at a charge of 5*s.* per specimen. (It is estimated that in the first year 200 specimens will be forwarded from the venereal clinics provided for the Bournemouth authority; and 20 specimens from private medical practitioners in Bournemouth.) That arrangements be made with the Bournemouth borough bacteriologist for the examination of specimens with a view to the detection of the spirochæte of syphilis and the micro-organism of gonorrhœa at a charge of 3*s.* 6*d.* per specimen; and if the number of spirochæte examinations falls below 60 during the year, of 4*s.* per spirochæte specimen. (It is estimated that in the first year the clinic will require 200 examinations for gonorrhœa, and 100 for syphilis; and that medical practitioners in Bournemouth will require the examination of 40 specimens for gonorrhœa and 20 for syphilis.) That the medical officer of health make arrangements for the provision of apparatus for the collection of specimens, with circular of instructions. The estimated expenditure on these recommendations is £148.

Clinics and hospital beds.—That arrangements be made with the Royal Victoria and West Hants Hospital and with the Cornelia Hospital, Poole, for the treatment at clinics of patients from Bournemouth and for the in-patient treatment of such of these cases as may require it. (A tentative estimate of the cost incurred by the treatment, except the supply of salvarsan, at the Bournemouth Voluntary Hospitals is £350 and at the Poole Voluntary Hospital £70.)

Extra clinic consultations.—That arrangements be made with the senior medical officer of the Bournemouth Hospital venereal clinic for attendance at consultations with medical practitioners elsewhere than at the clinic, at a charge of £1 per consultation. (During the first year ten such cases are estimated for.)

The report recommends further: That infants—if breast-fed, accompanied by their mothers—suffering from ophthalmia neonatorum should be admitted into the sanitary hospital; and that the medical officer of health, in addition to his other duties, should give addresses on venereal diseases to clergymen, pharmacists, and midwives.

Enlightenment Campaign.

A conference of citizens representing the various interests—municipal, industrial, educational, social, and religious—in the metropolitan borough of Southwark has been convened by the Mayor of Southwark at the Town-hall, Walworth-road, London, S.E., on Friday, May 4th, at 5 P.M. The chairman and honorary secretaries of the National Council for Combating Venereal Diseases will outline the work of the National Council and suggest methods for an effective educational campaign.

Unqualified Treatment and the Central Midwives Board.

At a recent meeting of the Central Midwives Board a letter was considered from the honorary secretary of the Leicester and Leicestershire Midwives Association urging the immediate introduction of legislation for the purpose of rendering it a penal offence for any person other than a qualified medical practitioner to undertake the treatment of venereal diseases. The Board decided—

That, in view of the grave national dangers arising from the neglect or the improper treatment of venereal diseases, the Central Midwives Board considers that legislation should be introduced with the least possible delay, for the purpose of rendering it a penal offence for any person other than a registered medical practitioner to undertake the treatment of venereal diseases, and directed that this decision should be communicated to the National Council for Combating Venereal Diseases.

LITERARY INTELLIGENCE.—Messrs. Butterworth & Co. (India), Limited, announce the forthcoming publication of a monograph on "The Treatment of Kala-azar," by Dr. U. Brahmachari, lecturer on medicine at Campbell Medical School.

COLLOSOL COCAINE.

THE successful outcome of the experiments leading to the production of colloidal quinine, morphine, and cocaine was foreshadowed by THE LANCET, and we are now able to state that a collosol of cocaine has been prepared at the Crookes Laboratories, where the idea was conceived of obtaining the alkaloids in colloidal form isomorphic with the colloidal protein of the body. A quinine collosol is also, we understand, prepared.

Samples of collosol cocaine have been submitted to Professor W. J. Simpson, professor of hygiene, King's College, London; Professor R. Tanner Hewlett, professor of bacteriology in the University of London; and to Dr. John Eyre, director of the Clinical Bacteriological Departments, Guy's Hospital, whose reports on the tests made with the object of testing the toxic and anæsthetic properties of this drug are as follows :—

University of London, King's College, Strand, W.C., March 23rd, 1917.

TESTS OF TOXICITY.

1 per cent. Collosol Cocaine.	*1 per cent. Cocaine Hydrochloride.*
I. Rabbit No. 4.—Weight, 3270 grammes. 0·26 c.c. injected intravenously. No effect. (March 13th.)	I. Rabbit No. 3.—Weight, 2070 grammes. 0·20 c.c. injected intravenously. No effect. (March 13th.)
II. Rabbit No. 4.—0·75 c.c. injected intravenously. No effect. (March 13th.)	II. Rabbit No. 3.—0·5 c.c. injected intravenously. No effect. (March 13th.)
III. Rabbit No. 4.—5 c.c. injected intravenously. No effect. (March 15th.)	III. Rabbit No. 3.—3 c.c. injected intravenously. Immediately after injection the animal collapsed and became insensible, 5 minutes later convulsive twitchings, eyes insensitive. 10 minutes recovering, but weak on hind legs and eyes now sensitive; 15 minutes practically recovered. (March 15th.)
IV. Rabbit No. 3.—3 c.c. injected intravenously. No effect. (March 16th.)	IV. Rabbit No. 4.—5 c.c. intravenously. Collapsed immediately after injection, with slight twitching, and died almost at once. (March 16th.)
V. Rabbit No. 6.—Weight, 2770 grammes. 5 c.c. injected intravenously. No effect.	V. Rabbit No. 3.—3 c.c. injected intravenously. Immediately collapsed and died. (March 19th.)
VI. Rabbit No. 6.—10 c.c. injected intravenously. No effect. (March 19th.)	VI. Rabbit No. 5.—Weight, 2750 grammes. 3·5 c.c. injected intravenously. Immediately after injection was convulsed and died almost at once. (March 19th.)

From these tests of toxicity we find that about 3 c.c. of a 1 per cent. solution of ordinary cocaine hydrochloride (equivalent to about ½ grain) is a fatal dose for a rabbit of 2000-3000 grammes weight, injected intravenously.

As regards the collosol cocaine, 10 c.c. of the 1 per cent. preparation (equivalent to about 1·6 grains) produced no toxic effect whatever.

W. J. SIMPSON.
R. T. HEWLETT.

Guy's Hospital (Bacteriological Department), April 21st, 1917.

REPORT ON SPECIMEN OF COLLOSOL COCAINÆ 1 PER CENT., RECEIVED FROM MESSRS. CROOKES' LABORATORIES.

A. *Toxic properties.*—A full-grown rabbit, weighing 2000 grammes, received on March 1st 2 c.c. of collosol cocainæ 1 per cent. intravenously, the injection being made at the rate of 1 c.c. per minute. No immediate or remote effects were observed. On March 12th the same rabbit received 15 c.c. of the same solution intravenously, within ten minutes. No immediate or remote effects were observed. Five hours later 3 c.c. of the 1 per cent. solution of cocainæ hydrochlor. were injected at the rate of 1 c.c. per minute. Just before the injection of the third c.c. had been completed the animal was seized with convulsions and died within a minute. Identical results were obtained on two subsequent occasions. In my opinion, therefore, collosol cocainæ can be regarded for all practical purposes as non-toxic.

B. *Anæsthetic properties.*—1. Two drops of collosol cocainæ dropped into the left eye of a rabbit produced mydriasis and complete anæsthesia in three minutes. 2. Two drops collosol cocainæ instilled into the left eye of the human subject produced complete anæsthesia and enabled me to remove a foreign body embedded in the cornea, without pain. (I can personally vouch of the completeness of the anæsthesia, as the foreign body was embedded in my own cornea and I removed it myself in front of the looking-glass.) 3. 0·8 c.c. collosol cocainæ injected into the male urethra (a very nervous and sensitive patient) produced complete anæsthesia in five minutes and permitting the passage of a 7·5 mm. urethrascope.

The above three representative examples indicate the nature of evidence, which, in my opinion, establishes the claim of the Crookes collosol cocainæ that it can be regarded as an efficient local anæsthetic.

JNO. EYRE.

It is certainly not a little remarkable that colloidal cocaine can be given exclusively for its anæsthetic effects, and it seems probable that we are in the presence of a remarkable development in therapeutics, as we on a previous occasion predicted might occur in connexion with colloidal treatment.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

To be temporary Surgeons: R. E. Rampling, D. Heard, T. L. P. Harries, F. M. Mosely, A. E. P. Parker, N. Braithwaite.

The following appointments have been notified: Fleet Surgeon: W. H. Pape to *Pembroke*. Surgeons: C. F. Willis to *Halcyon*, and E. C. Holton to *Vivid*. Surgeons (temp.): M. Neilson to *Leander*, R. A. Hobbs to *Albion*, D. W. Warren, J. R. S. Thompson, and J. H. B. Hogg to *Vivid*, R. M. Barrow and R. L. Glass to *Pembroke*, H. Waldo and J. L. Lamond to *Victory*.

ARMY MEDICAL SERVICE.

Col. J. T. Fotheringham, C.M.G., Canadian A.M.C., to be temporary Surgeon-General.

Lieut.-Col. (temp. Col.) R. R. Sleman relinquishes his temporary rank on vacating the appointment of Assistant Director of Medical Services.

Col. J. H. Daly is retained on the active list and to be supernumerary.

Capt. D. W. Hardy to be Deputy Assistant Director of Medical Services.

TERRITORIAL FORCE.

Lieut.-Col. W. K. Clayton to be temporary Colonel whilst an Assistant Director of Medical Services.

Lieut.-Col. (temp. Col.) J. Young relinquishes his temporary rank on vacating the appointment of Assistant Director of Medical Services.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. R. R. Sleman is restored to the establishment.

Capt. (temp. Maj.) J. W. Keay to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

A. M. Paterson to be temporary Major.

Temp. Capt. Gerald S. Samuelson to be temporary Major whilst commanding troops on a Hospital Ship.

Capt. R. C. Carlyle is seconded for service with the Egyptian Army.

Capt. D. W. Hardy is seconded while holding an appointment as Deputy Assistant Director of Medical Services.

Lieut. A. C. Ainsley to be Captain.

Temp. Lieut. George F. B. Simpson to be temporary Captain.

H. T. Thomson to be temporary Honorary Captain whilst serving with No. 11 Stationary Hospital.

E. Harding to be temporary Honorary Captain whilst employed with No. 22 General Hospital.

Temp. Capt. F. G. Crookshank relinquishes his commission.

Temp. Hon. Lieut. T. A. Loughrey, from Canadian A.M.C., to be temporary Lieutenant.

SPECIAL RESERVE OF OFFICERS.

Lieutenants to be Captains: T. Crisp, A. L. Giblin, M. McG. Russell, R. C. B. Ramsay, A. L. V. Davin, W. Richards.

TERRITORIAL FORCE.

Lieut.-Col. W. K. Clayton is seconded whilst holding an appointment of Assistant Director of Medical Services.

Capt. (acting Lieut.-Col.) A. A. Hingston reverts to the temporary rank of Major on ceasing to command a Field Ambulance.

Lieut.-Col. J. Young is restored to the establishment.

Capt. (temp. Lieut.-Col.) P. Moxey relinquishes his temporary rank on ceasing to command a Field Ambulance.

Capt. H. G. Annis to be acting Major whilst in command of a Field Ambulance.

URBAN VITAL STATISTICS.

(Week ended April 14th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000, the annual rate of mortality was 18·5, against 18·0 and 17·3 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 19·5, or 2·6 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 7·0 in Edmonton, 8·2 in Grimsby, and 9·1 in Eastbourne, to 28·2 in Dudley and in Southend-on-Sea, and 38·6 in Hastings. The principal epidemic diseases caused 506 deaths, which corresponded to an annual rate of 1·6 per 1000, and included 320 from measles, 66 from whooping-cough, 51 from infantile diarrhœa, 45 from diphtheria, 13 from enteric fever, and 11 from scarlet fever. The deaths from measles showed a further increase compared with the numbers in the 11 preceding weeks, and caused the highest annual death-rates of 3·6 in West Ham and in Sunderland, 5·2 in South Shields, 5·9 in Bolton, and 7·3 in Dudley. The 722 cases of scarlet fever and the 1317 cases of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 33 below and 20 above the numbers at the end of the preceding week. Of the 6010 deaths from all causes in the 96 towns, 187 resulted from violence. The causes of 67 of the total deaths were uncertified, and included 10 in Liverpool, 8 in Birmingham, and 5 in Sheffield.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 19·1, against 17·9 and 16·9 per 1000 in the two preceding weeks. The 410 deaths in Glasgow corresponded to an annual rate of 19·2 per 1000, and included 27 from measles, 22 from whooping-cough, 7 from infantile diarrhœa, and 2 from diphtheria. The 141 deaths in Edinburgh were equal to a rate of 22·2 per 1000, and included 22 from measles, 18 from whooping-cough, and 1 from infantile diarrhœa.

Irish Towns.—The 205 deaths in Dublin were equal to a rate of 26·8 or 2·9 per 1000 above that recorded in the previous week, and included 18 from measles, 2 from infantile diarrhœa, and 1 from whooping-cough. The 170 deaths in Belfast corresponded to an annual rate of 22·6 per 1000, and included 4 each from enteric fever and measles and 3 each from whooping cough and infantile diarrhœa.

Correspondence.

"Audi alteram partem."

"SOLDIER'S HEART."

To the Editor of THE LANCET.

SIR,—As medical adviser to a large insurance company a considerable number of cases were referred to me recently in connexion with the short-term endowment policies for the purpose of the War Loan. Among them one group specially impressed me in relation to the subject of "soldier's heart," recently discussed in your columns.

I saw several young men, some looking jaded and worn, others robust and well, who all alike said they had been discharged from the Army as unfit for service for valvular disease of the heart; some showed me their certificate to that effect. On my examination the heart yielded no abnormal physical signs. It was of the usual size, its apex in the proper place, its action regular, and its sounds normal. There were no murmurs and no cardiac symptoms. The heart was therefore presumably healthy. It was, at any rate, certain that there was no valvular disease. The men when at the front, I ascertained, had some cardiac symptoms—viz., shortness of breath, palpitation, and even pain on exertion—i.e., signs of cardiac overstrain. They were therefore rightly put upon the sick-list. I presume there must have been murmurs also upon which the diagnosis of valvular disease must have been made.

The cardiac murmurs which are associated with nervous excitement and with dilatation of the heart do not seem to be as familiar as they should be to those who are responsible for these certificates, for though the cases I speak of came in a group several others have fallen under my observation in private practice, and I have for some time had it in mind again to draw attention to the subject. These functional murmurs, as they are usually called, are almost without exception systolic, and may be heard at the base, or apex, or widely over the whole præcordium. Of the base murmurs it is unnecessary to refer to those at the left or pulmonary base, associated with anæmia, especially as they are hardly ever met with in young men. A more important murmur, but one rarely referred to, and, I think, not generally recognised, is that which, systolic as usual, occurs over the aortic base and above. It is more frequently met with under those very conditions which these "soldier's" cases would present—viz., nervous excitement where the results of the examination and the decision based upon them are important, and arouse anxiety in the candidate. In ordinary times this murmur is most often met with in candidates for insurance, where marriage, it may be, or a valuable appointment hangs upon the verdict. This murmur is often quite loud, audible at the right base and for a short distance above, and it may be almost musical. It is not unlike the murmur of slight organic disease, but it is transitory, disappearing, it may be, in a few minutes when the excitement passes off, and it is easily reproduced if the excitement returns.

Besides these murmurs at the base, transitory murmurs may be heard at the apex or over the body of the heart. These have been called dilatation murmurs—not a good name as mixing up facts and interpretation, but justifiable perhaps in this instance as the murmurs vary with the dilatation and come and go with it. Though systolic in time they are not propagated as they should be if these were due to regurgitation through the mitral or tricuspid valves. On the left side they are limited to the præcordial area and are not heard in the axilla or behind. Where dilatation of the heart is extreme they may be propagated just as the murmurs due to organic disease both on the right and left side, and these no doubt are truly regurgitant, but it is not in these cases that the diagnosis is difficult, for the evidence of extreme dilatation is obvious. When the heart is weak, as in convalescence from long illness, these murmurs may be easily produced by a little over-exertion and their association with dilatation be easily demonstrated.

The diagnosis of valvular disease of the heart is a serious matter for the subject of it. Wrongly made it may unfairly ruin a promising career in the Army or in some other profession where a certificate of health is required, while it will, of course, strongly prejudice the prospects of

life insurance. Worst of all, it may partly by the alarm it may excite, and partly owing to the treatment which such a diagnosis is thought to involve, convert the unhappy victim into a cardiac hypochondriac, and make him a misery to himself and all about him. I recall the case of a young man who presented himself for examination for an insurance on his life prior to his marriage. The doctor looked gravely at him and said, "Young man, *walk* through life." He did not walk through life, but ran at a racing speed. Yet he lived till a good age, and never had a cardiac sign or symptom. Fortunately, the man had too busy a life to act on the suggestion or to dwell on it. Otherwise it might have been disastrous.

If the existence and frequency of these murmurs be kept in mind the diagnosis is, as a rule, not difficult. Mistakes can be avoided by a little more knowledge and caution. The knowledge would suggest caution, and the caution would be justified by the disappearance of the murmurs and the proof that the suggested diagnosis was wrong.

I am, Sir, yours faithfully,

Wimpole-street, W., April 21st, 1917. SAMUEL WEST.

"MILITARY CARDITIS."

To the Editor of THE LANCET.

SIR,—May I suggest "military carditis" as a useful term for the soldier's cardiac effort syndrome of which so much has been heard recently? We have the authoritative example of Thomas Watson for such a comprehensive term when dealing with a problem that is not easily defined, and as a former pupil of Dr. Frederick Roberts I think there is much to be said for the emphasis he used to lay upon what he called "cardiac apparatus" when discussing problems of the heart. In an organ like the heart where the three parts—endo-, myo-, and peri-cardium—are so intimately associated it is difficult to draw a hard-and-fast line between disease of the one and the others; in fact, in many cases it cannot be done.

So far attention has been devoted almost entirely in "military carditis" to the myocardium, apparently because the peri- and endo-cardia do not show any gross lesions, but neither does the myocardium in many cases. I have drawn attention elsewhere to the importance of the pericardium and its fluid, pointing out that that fluid exists normally under a negative pressure, whereby the fluid is kept at an equal thickness all over the surface of the heart. I have pointed out also that most likely the movements of this peculiarly circumstanced fluid have much to do with the sounds of the heart, a contention that is supported by my rubber balloon experiments. The opinion I have formed after examining many hundreds of men before the furnaces, as well as boys before and after running, is that the increased cardiac dullness is due to an increase of pericardial fluid which is of such physiological importance in connexion with the running of the accelerated heart. Experiments also bear out this statement, for the pericardia of rabbits shot standing contain less fluid than the pericardia of those shot when driven out by ferrets—i.e., under stress and strain. Another interesting fact in this connexion is that the effect of killing cats by chloroform is to cause an increase of pericardial fluid and a sudden variation of the intrapericardial pressure.

Does shell shock produce such a sudden variation of the intrapericardial pressure? and does it thereby cause a disturbance of the regular wave movements of the fluid which are to a great extent responsible for the sounds of the heart? Dr. Lewis, who is quoted as an authority on electrocardiography, states that the curves are due to impulses which have travelled the auriculo-ventricular bundle, although similar curves are obtainable from the lower order of animals in which there are no such bundles! The fact that throughout the vertebrate series we find pericardia and pericardial fluids is evidence of their great importance, and that the latter have much to do, by means of their electrical resistance, with the causation of the so-called electro-cardiograms.

As a result of my experiments I have devised a double-chested stethoscope, which I call the "Cardioscope," whereby I find that in normal hearts the sounds conducted to each ear separately are equal, whereas in abnormal states the sounds are unequal. By this instrument one hears the "murmurs" resolved into other sounds.

I am, Sir, yours faithfully,

Swansea, April 14th, 1917. G. ARBOUR STEPHENS.

THE TECHNIQUE OF LUMBAR PUNCTURE.

To the Editor of THE LANCET.

SIR,—Surgeon F. A. Williamson's letter in your issue of April 21st refers, as you remark, to a real difficulty occasionally experienced in the technique of lumbar puncture and one to which he does well to draw attention. The failure of a considerable collection of cerebro-spinal fluid to flow freely until the needle is manipulated whilst *in situ* may be due to the fact that a constituent of the cauda equina temporarily blocks the needle at its orifice, or that the needle at first enters only a small loculus of fluid and not the main cisterna. In connexion with the first possibility it may be noted that if the lumbar cisterna is distended by fluid there would be a greater tendency for a nerve root to be pressed against the orifice of the needle than if the normal conditions obtained. In connexion with the second possibility, it must be remembered that the pia-arachnoid system is not a simple cavity but a series of small and large cavities separated by trabeculæ. The free intercommunication in health of the loculi so formed is no doubt interfered with in disease by the added factor of plastic lymph deposit. Whatever the cause may be, the moral, as your correspondent points out, is not to be content with a restricted flow in any case, and especially not to be content with this result in a case suspected on clinical grounds to be one of cerebro-spinal fever, until the needle is pushed a little farther in or is slowly withdrawn a little, or is tested as to its patency by passage of the trocar or stylet. I use the term "restricted flow" rather than "at a normal rate" in such a case, because I am always more suspicious that I am dealing with an instance of the difficulty to which your correspondent refers when the fluid flows at *less* than the normal rate. I think many practitioners underestimate the initial rapidity of the normal rate of flow immediately after the puncture is made.

It may not be out of place to refer to one or two other difficulties that not infrequently present themselves in connexion with lumbar puncture. One of these again has to do with restricted flow of the fluid. Operators sometimes use a long needle for a small patient, and do not notice that the needle is pointing upwards, its delivery end being well above the level of any part of the cerebro-spinal system. This difference of levels may have been increased by raising the hips well on to the edge of the bed for convenience of the procedure, thus leaving the child's trunk and head in the trough of the bed. Should the cerebro-spinal pressure not be much, or at all, raised, very little fluid may flow until the patient's hips are rolled over towards the needle, the delivery end of which is thus brought to a much lower level. This point in technique becomes important when it has been decided to drain a highly purulent exudate as completely as possible.

The admixture of blood with the cerebro-spinal fluid constitutes another difficulty in the technique, as it prevents accurate chemical and histological investigations. If this is seen to occur the first few drops of fluid should be received into a separate vessel (indeed, this is always a sound thing to do), and the needle should be slowly withdrawn a little, because it is very likely that the blood is contributed by the venous plexus lying on the anterior wall of the canal. If the blood is still present, and it is not obvious from the naked-eye examination that the fluid is also purulent—in which case the histological and chemical examination becomes of no great differential value—the needle should be withdrawn and a fresh puncture should be made at a different space.

Finally, a word may be added in regard to so-called "dry punctures." If the points in manipulation referred to above are observed, it may almost certainly be concluded that the meaning of a dry puncture is that the needle has not entered the pia-arachnoid space at all.

I am, Sir, yours faithfully,

Harley-street, W., April 22nd, 1917. THOMAS J. HORDER.

THE AFTER-TREATMENT OF INFECTED HÆMOTHORAX.

To the Editor of THE LANCET.

SIR,—Since one of the chief dangers of an infected hæmothorax is the secondary infection which almost invariably occurs after resection and drainage, any method of treatment

which will lessen or prevent this will prove of the utmost importance and value.

The results of the Carrel-Dakin method have been most striking and shown by:—1. The uninterrupted improvement in the general condition of the patient after resection and the rapid settling of the temperature. 2. The very rapid obliteration of the cavity. 3. The small quantity and inoffensive nature of the discharge. 4. The firm primary union of the sutured portions of the empyema wound.

After resecting and draining in the usual way the Dakin's solution is not at first run into the pleural cavity on account of the risk of breaking down loose adhesions, but the dressings are kept constantly moist by means of irrigation every two hours with a few ounces of the solution. The procedure here is to use a Carrel tube in the form of a horseshoe with multiple small perforations. The open ends are connected with the tube leading to the reservoir by a two-way glass connexion. The horseshoe is kept in position by being placed under the safety-pin of the drainage-tube and by being attached to the chest higher up. The surrounding skin may be protected with sterile vaseline, but in practice this is not essential, since the hypochlorite rapidly loses its tendency to irritate after contact with the discharge from the empyema. After ten days or a fortnight a Carrel tube with few terminal perforations may be inserted into the pleural cavity alongside the drainage-tube and irrigation every two hours with a few ounces of *half-strength* Dakin-Daufresne solution carried out.

After an extended experience of septic hæmothorax and the deleterious effects of the secondary infection after resection we have been firmly convinced of the value of the above method in lessening or almost preventing this important complication. I am, Sir, yours faithfully,

C. DEAN, M.B. Oxon.

Millicent Sutherland Ambulance, B.E.F., April 17th, 1917.

THE CLOSURE OF COLOTOMY OPENINGS.

To the Editor of THE LANCET.

SIR,—Had Mr. P. Lockhart-Mummery, in his letter to THE LANCET of April 7th, confined himself to the subject of his paper I should not have troubled you with a second communication, but as he has extended his remarks to the methods of treating cancerous growths of the colon, and asks "Why are surgeons so shy of primary resections and suture of the colon that they subject their patients to three operations where one would do?" and as he goes on to say that "this seems an altogether unnecessary procedure," his attitude towards a subject of which he professes to be a master demands attention.

If he will turn to the transactions of the Surgical Section of the International Congress of Medicine held in London in 1913 he will find in the report of Professor Bastianelli and the subsequent discussion on the treatment of cancer of the colon the answer he requires.[1] As this report in full may not be accessible to some of your readers I may say, briefly, that one of the most serious bars to the success of primary resection of the colon is the presence of hard fæcal masses above the growth, and that this handicap can be removed by a preliminary proximal colostomy followed by washing out the diseased segment of bowel. By this means we secure a relatively clean field for operation, while afterwards the line of union is freed from the irritation of the fæcal stream, now diverted. Again, intracolic pressure and tension on the suture line from gaseous distension are entirely obviated and rest, so essential to good union of intestinal wounds, is secured. It is worth while noting that Mr. Lockhart-Mummery, in a later paragraph in his letter, while advocating his view that the bowel should be made to act daily from the time of the resection unconsciously furnishes reasons for the multiple operation. Thus, he states that "flatus in the bowel is far more dangerous than a little liquid fæces," and, again, that "the one thing to avoid is the presence in the neighbourhood of the anastomosis of masses of hard fæces."

From a long and fairly large experience of resection of the colon with and without actual intestinal obstruction I am firmly convinced that the inclusion of a preliminary colostomy has reduced enormously the death-rate of the operation. Reverting to the original subject, Mr. Lockhart-Mummery asserts that the Greig-Smith operation is "liable to leave a weak spot," that "many patients have to wear a belt," and that "it may be followed by stricture." My reply is that I have not seen a single instance of any one of these defects, nor do I think any of them should occur if the operation is properly done, and certainly not in the case of young soldiers with well-developed abdominal muscles. Possibly some ambiguity as to the essentials of the procedure has arisen from calling it the extraperitoneal method. Personally, as I said in my former letter, I do not dread opening the peritoneum. The one factor which makes the operation so much safer than resection of the bowel is that the mesenteric side of the colon with its vascular and nerve-supply is not interfered with.

As to details, the most important thing to attend to is to freely mobilise the opening and the adjacent colon. When this has been done the involved segment can be lifted out of the abdomen, and with adequate gauze packing it is a matter of little or no consequence whether the peritoneum is, or is not, opened. As to stricture following the operation, bearing in mind that usually at least one-half of the circumference of the bowel is not involved, and that if the sutures are inserted at right angles to the long axis of the colon the lumen is not encroached on, and that most preliminary colostomies are placed in the capacious ascending colon, there need be no fear of this developing. One word as to the spur. This formidable bugbear exists only so long as the colon is anchored to the abdominal parietes. Freely mobilise the involved segment of the bowel and the spur ceases to have any significance and enterotomes any useful application. I am, Sir, yours faithfully,

Sheffield, April 7th, 1917. SINCLAIR WHITE.

[1] THE LANCET, 1913, ii., 480.

READING BY EAR.

To the Editor of THE LANCET.

SIR,—I notice in your issue of April 14th certain criticisms by Sir Arthur Pearson on the speed attainable in reading ordinary letterpress by ear with the optophone. The speed attained on March 28th was a maximum of three words a minute. My estimate of 25 words a minute was based on the fact that the signals remain clear and characteristic at that speed. It is therefore only a matter of practice. Three months ago neither I nor anybody else had ever read a line of letterpress by ear. The reading of the *Times* blindfold is now a possibility demonstrated beyond doubt or cavil. The instrument is substantially that described in Roy. Soc. Proc., A, 90, p. 373.—I am, Sir, yours faithfully,

E. E. FOURNIER D'ALBE, D.Sc.

Maddox-street, W., April 20th, 1917.

Obituary.

WILHELM WINTERNITZ.

Wilhelm Winternitz, who died, we now learn, on Feb. 22nd at the age of 82 years, was emeritus professor of medicine in the University of Vienna and had long earned the title of the "father of scientific hydrotherapy," presiding in this capacity at the last great balneological congress held at Meran before the war. From the time of his inargural dissertation (1865) on "The Rational Basis of Certain Hydrotherapeutic Measures" to the appearance, a few days before his death, of "The Water-Cure and Natural Immunity" Winternitz was constantly occupied in research on physical treatment. Many of his studies of the action of thermo-mechanical influences on the circulation and metabolism are now classical, as well as the long and bitter feud between himself and Liebermeister with regard to the bath treatment of infectious diseases. His idea of determining a blood-flux to particular organs and parts of the body was worked out in great detail long before Bier annexed the word "hyperæmia." Winternitz's belief in his own methods was very great, so that he imbued his patients with a like confidence, and he was for nearly half a century one of the busiest consultants in Vienna. But in spite of his great popularity he remained an inquirer and a research student to the last, intent on improving the field of medicine which he had so specially made his own.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed.

Capt. T. W. Martin, R.A.M.C., attached Royal Scots, received his medical education at Victoria University, Manchester, and qualified in 1912. He was in practice at Hale, Cheshire, before joining the R.A.M.C.

Capt. V. K. Sadler, R.A.M.C., was educated at Rossall School and at University College, London, and qualified in 1907. After serving as medical officer at Tiverton Infirmary he became a surgeon to the P. and O. Line. Later he joined the R.A.M.C., and went to the front at the beginning of this year.

Capt. G. R. Plaister, R.A.M.C., attached York and Lancaster Regiment, was a student at the London Hospital and qualified in 1905. He was in practice at Tottenham, London, before joining up, and went to the front in September, 1915, taking part in the engagements at Loos and on the Somme.

Lieut. E. Evans, R.A.M.C., attached Royal Welsh Fusiliers.

Accidentally Killed.

Capt. J. J. Weaver, R.A.M.C., was a student at University College, London, and qualified in 1886. He was medical officer of health for the county borough of Southport, and had made several contributions to the medical journals. He died at Curragh Camp as the result of a riding accident.

Died.

Lieut. L. G. Scudamore, R.A.M.C., was a student at St. Thomas's Hospital, London, and qualified in 1891. He was in practice at New Tredegar, Mon., prior to joining the R.A.M.C. in June, 1916, and died in camp in England after a short illness.

Capt. T. McCosh, M.C., R.A.M.C., qualified at Glasgow in 1905 and held a house appointment at the Glasgow Western Infirmary. He was in practice at Woodford Green, Essex, previous to joining the R.A.M.C., and had been awarded the Military Cross.

Died of Wounds.

Lieut. J. A. Gregory, R.A.M.C., was educated at Manchester University and qualified in 1914. He held the appointment of house surgeon at the Evelina Hospital for Children, London, and joined the R.A.M.C. in June last.

Wounded.

Major G. J. Boyce, Canadian A.M.C.
Capt. J. F. Murphy, M.C., R.A.M.C., attached Royal Field Artillery.
Capt. W. Parker, R.A.M.C., attached King's Own Scottish Borderers.
Capt. J. S. Prentice, R.A.M.C., attached Royal Berks Regiment.
Capt. J. G. Brown, R.A.M.C., attached Royal Irish Rifles.
Capt. A. Short, New Zealand Medical Corps.
Capt. A. H. Thomas, R.A.M.C.
Capt. T. C. Storey, R.A.M.C.
Capt. R. J. Gardiner, Canadian A.M.C.
Capt. G. R. Johnson, C.A.M.C., attached Canadian Infantry.
Capt. W. G. Goudie, R.A.M.C., attached Royal Flying Corps.
Capt. R. A. W. Proctor, R.A.M.C., attached Royal Fusiliers.
Capt. G. J. Linklater, R.A.M.C.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war :—

Second Lieut. R. A. Patterson, Rifle Brigade, second son of Dr. C. S. Patterson, of Eastbury, Berks.
Lieut. B. Rundle, Australian D.A.C., youngest son of the late Dr. G. E. Rundle, of Creewood, Sydney, Australia.
V. E. J. Bristowe, R.A.M.C., attached East African Expeditionary Forces, youngest son of the late Dr. J. S. Bristowe, F.R.S., of London.
Capt. T. W. Martin, R.A.M.C., attached Royal Scots, younger son of the late Dr. W. Y. Martin, J.P., of Walkden, near Manchester.
Capt. K. J. Barrett, Royal Fusiliers, elder son of Lieut.-Col. J. W. Barrett, C.M.G., R.A.M.C., of Melbourne, Australia.
Capt. J. J. Weaver, R.A.M.C., elder son of the late Dr. J. Weaver, of Southport.
Lieut. W. D. Chepmell, Royal Sussex Regiment, son of Dr. C. Chepmell.
Second Lieut. H. C. Oulton, Leinster Regiment, second son of Dr. H. W. Oulton, of St. Stephen's Green, Dublin.

FOREIGN DECORATIONS.

By the King of the Belgians.

Ordre de la Couronne.—Officier : Capt. S. R. Douglas, late Indian Medical Service, St. Mary's Hospital, London; Temp. Col. Sir A. E. Wright, C.B., Army Medical Service, St. Mary's Hospital, London. *Chevalier :* Temp. Lieut. E. Shaw, R.A.M.C.

By the King of Serbia.

Order of the White Eagle, 4th Class.—Lieut.-Col. E. T. F. Birrell, C.M.G., R.A.M.C.; Maj. M. J. Cromie, R.A.M.C.

By the Sultan of Egypt.

Order of the Nile.—3rd Class : Maj. R. G. Anderson, R.A.M.C., late Assist.-Adjt.-Gen., Recruiting Dept., Egyptian Army; Maj. W. Byam, R.A.M.C., late Medical Corps, Egyptian Army. *4th Class :* Capt. E. Gibbon, R.A.M.C., attached Medical Corps, Egyptian Army.

THE CENTRAL MEDICAL WAR COMMITTEE AND THE MOBILISATION OF THE MEDICAL PROFESSION.

Lord Derby's letter to the medical profession was the subject of discussion at a special joint meeting on Tuesday last of the Central Medical War Committee and the Committee of Reference of the Royal Colleges, when the following resolution was unanimously adopted on the motion of Sir Watson Cheyne, President of the Royal College of Surgeons of England, seconded by Mr. E. B. Turner, Chairman of Representative Meetings of the British Medical Association :—

That the Central Medical War Committee and the Committee of Reference cannot continue to bear the responsibility in the eyes of the medical profession and of the community for protecting the medical needs of the civil community while meeting the requirements of the Army unless they still have the duty of deciding how many doctors and which individuals can in fact be spared at any given time from civil work in a particular place to enter military service, and that, therefore, unless the War Office will undertake not to grant any commission to a doctor, even though volunteering for service, whom the committees consider to be for the time being indispensable for civil work, the committees will be unable to take any further part in the selection of doctors for military service.

Copies of the resolution were sent to the War Cabinet, the Secretary of State for War, and the Director-General of the Army Medical Service.

The reasons which have led the Central Medical War Committee to take this step are given at length in a statement, dated April 25th, a copy of which was sent to Lord Derby and which was issued later to the press.

In order to make the position plain the Central Medical War Committee conceives it to be its duty to the civil community to place on record a statement of the reasons which lead the Committee, in virtue of its special knowledge gained from the work it has done, statutory and otherwise, for the Government, to the conclusion that, unless special precautionary measures are adopted, the immediate calling up of all doctors under 41 for military service affected by the War Office must inflict grave injury on the civil community in many parts of the country, particularly in the industrial areas upon which so much depends, both as to the production of war material and otherwise, for the carrying on of the war.

It is obvious that, in order to avoid a breakdown in a locality, it is essential that before any doctor at present engaged in civil work is actually withdrawn from his duties, the question as to whether he can at the time safely be spared from civil work must have been properly investigated, to the extent required by the nature of the case, either by the Central Medical War Committee, or by some other body acting on behalf of the Government possessed of the knowledge requisite for gauging the needs of the locality.

Hitherto the Central Medical War Committee, aided by its local committees in all parts of the country, and in coöperation with the Government departments concerned, has performed this duty for the Government, watching continuously the varying conditions of the medical services in each locality, and determining from time to time, in the light of those conditions, how many and which doctors could be spared at any particular moment.

The notice issued by the Recruiting Department on Wednesday, April 18th, calling up all the doctors under 41 for immediate departure on service on April 26th threw the Committee's machinery entirely out of action, and, although it would seem from certain phrases in Lord Derby's letter published subsequently that some revival of the former arrangements with this Committee is contemplated, it is clear that nothing short of a Government decision to maintain the complete continuance of the requisite scrutiny will suffice to avert grave danger.

The following places may be mentioned as illustrating the dangers which, in the absence of such scrutiny, must inevitably arise in many areas :—Town *A* (chemicals and munitions). Population over 20,000. Number of doctors 4, all of military age. Town and district *B* (shipbuilding). Population over 60,000. Number of doctors 10, 7 of military age. District *C* (coal-mining). Population over 37,000. Number of doctors 7, 6 of military age. District *D* (agricultural area). Population (of town alone) 3628. Two doctors, both of military age. Town *E* (country town). Population over 20,000. Number of doctors 4, 3 of whom are of military age. Town district *F* (industrial area). Population about 126,000. Number of doctors 25, of whom 4 are of military age. There is at present only one doctor to over 5000 people.

It is clear that from none of these areas could all the doctors liable under the Military Service Acts be withdrawn simultaneously without complete breakdown. But under the arrangements so far made in connexion with the immediate calling up of the doctors there is nothing to secure that these men will not in fact be withdrawn.

Doubtless the War Office, if aware of the facts, would not propose to take all the doctors from the town *A* and leave a population of 20,000 in a munition area entirely without any medical practitioners to look

after them. But the War Office is not in possession of the knowledge requisite for avoiding the mistake, nor is it possible for any general or mathematical rules to be formulated for such purpose. The necessary safeguards can only be applied by a body which is continuously surveying the needs and the comparative conditions of the various localities.

It is clear, the statement concludes, that if the situation above indicated is to be avoided, as the Government must obviously desire to secure, it must be definitely provided that no doctor, even if he himself offers no objection to going, shall be withdrawn by the War Office from the work of the civil community until the competent body authorised by the Government has ascertained and reported that his departure will not cause a breakdown.

Lord Derby's Reply to the Committee.

The reply received from the Secretary of State for War bearing the same date as the covering letter enclosing the Central Medical War Committee's resolution and statement was to the following effect:—

War Office, London, S.W. 1, April 25th, 1917.

GENTLEMEN,—I am in receipt of your letter of April 25th, and in answer to it I beg to state that I agree that the procedure prevailing up to last week with regard to the selection of doctors shall be continued, and I will further agree not to give a commission to any doctor except on the recommendation of your Committee.

Your Committee is asked to provide the Army with x doctors by May 1st, and y doctors per week after that date until the requisite number z has been found. In the event of the number so asked for not being forthcoming, I must reserve to myself the right at any time to reconsider the position.

I trust that this arrangement will be agreeable to your Committee, and that they will continue doing the excellent work for the War Office that they have done in the past. Yours faithfully,

(Signed) DERBY.

The Text of Lord Derby's Letter to the Medical Profession.

The text of the letter addressed by the Secretary of State for War to members of the medical profession in Great Britain was as follows:—

War Office, London, S.W. 1, April 21st, 1917.

SIR,—I am desired by the War Cabinet to ask your earnest consideration of the following matter. The enemy, in total disregard of the accepted tenets of civilised warfare, have deliberately instituted a submarine campaign against hospital ships. It has therefore become essential that a large number of hospitals should be established overseas in the various theatres of war for the treatment of the sick and wounded.

In order to allow of this being done, and done with great rapidity, it has become essential to secure the services of every member of the medical profession who can possibly be spared from this country. The figures in the possession of the Government make it plain that the number of doctors who could be spared from this country are more than are needed to supply the military requirements if adequate steps are taken, by the doctors over age or by other means, for doing the work in this country of the men who must now be taken for medical service overseas. For these reasons the War Cabinet have decided, as the first step in this process, that every medical man of military age must be called up at once under the Military Service Acts, in order that he may thus be made available at once, and that, if he cannot be spared from his locality without arrangements being made for carrying on his work, his case may be immediately investigated and decided upon and steps taken for securing a substitute for that work.

Every medical man thus summoned must, therefore, communicate immediately to the Central Medical War Committee (or the Scottish War Emergency Committee) if he is of opinion that circumstances (personal or public) make it impossible for him to go, e.g., that he can only be spared from his present duties when some arrangements have been made for doing his present work. May I express the earnest hope that every doctor over military age will immediately offer his services to the Local Medical War Committee of his area as willing to undertake any substitution work within his capacity which would help to release any man of military age who cannot otherwise be spared?

The War Cabinet recognise to the full the great services that the medical profession has rendered during the present war, and regret that the barbarous action of the enemy compels a further call on their services and a resort by the Government to measures which the Army Council had intended to avoid and could still have avoided but for this new phase of German outrage. They recognise that the new procedure must involve additional sacrifices for the people of these islands, and must fall heavily on the medical profession. But the War Cabinet trust and believe that this call will be met in the same splendid spirit with which previous calls have been met, and that members of the medical profession and the public whom they serve will ungrudgingly make whatever sacrifices may be necessary in order that our soldiers abroad may have the same attention and care which medical science provides for their comrades at home.

I am, Sir, your obedient servant,

(Signed) DERBY.

THE NATIONAL MEDICAL UNION AND MEDICAL MOBILISATION.

We have received from the National Medical Union a communication, signed by the chairman of the council and of the executive committee, welcoming that portion of Lord Derby's letter which states his determination to call up immediately all medical practitioners of military age, but objecting to non-panel practitioners being asked to attend patients under the National Insurance Act. The alternative is stated thus:—

While the simplest, and therefore the best, means for utilising the services of the whole profession at this juncture would, in our opinion, be the abrogation during the war of the Medical Benefit Section of the National Insurance Act, an emergency measure for the remuneration on non-panel lines of non-panel practitioners called upon to attend insured persons could, we believe, be devised with the funds now at the disposal of the National Health Insurance Department. It would be based upon the sound principle of payment for work actually done and would involve the allocation of no additional public money or instant disturbance of the Act.

THE WAR AND HOSPITAL SHIPS.

The sinking of hospital ships by the enemy continues. On April 17th the s.s. *Donegal* and the s.s. *Lanfranc* were torpedoed without warning. The *Donegal* was carrying slightly wounded cases, all of them British, out of whom 29 men and 12 of the crew are missing. The *Lanfranc*, in addition to 234 wounded British officers and men, carried 167 wounded Germans, a medical personnel of 52, and a crew of 123. Of these, 2 wounded British officers, 11 wounded British of other ranks, 1 R.A.M.C. staff, 5 crew, 2 wounded German officers, and 13 wounded Germans of other ranks are reported missing and presumed drowned. British patrol boats rescued 152 wounded German prisoners. The vessels were under escort, and one of them bore the distinctive marks laid down by the Hague Conference. The Admiralty announce that in future ships carrying wounded will bear no distinctive markings, and will proceed at night without lights, inasmuch as the prescribed markings now serve only to make the ships a better target for the enemy.

The International Red Cross Committee at Geneva has addressed a protest to the German Government in reference to its order of Jan. 29th regarding the sinking of hospital ships and the sequel to this order:—

The International Committee, whose right and duty it is to enforce respect for the principles of the Red Cross and the Geneva Convention by reporting violations of them, draws the very serious attention of the German Government to the responsibility which it would assume towards the civilised world by persisting in a resolution which is in contradiction to the humanitarian conventions which it has pledged itself solemnly to respect.

In torpedoing hospital ships it is not attacking combatants, but defenceless beings, wounded or mutilated in war, and women who are devoting themselves to the work of relief and charity. Every hospital ship is provided with the external signs prescribed by international conventions, the use of which has been regularly notified to belligerents, and should be respected by belligerents. The latter may, according to the Hague Convention, exercise the right of search, but have in no case any right to sink a ship and expose to death the hospital staff and the wounded.

The *Asturias* appears to have been torpedoed without any care having been taken to ascertain her character or her destination. Even if the correctness of the facts were admitted upon which Germany bases justification of her order, the International Committee considers that nothing can excuse the torpedoing of a hospital ship, and expresses the hope that such an order, contrary to international conventions, will cease to be carried out.

MEDICAL MOBILISATION IN AMERICA.

A practical spirit pervades the preparations which are being made by the medical profession in America for the emergencies of war. A recent number of the *New York Medical Journal* states the statistical side of the problem:—

Our regular army now numbers 125,000 men, and the National Guard about 160,000. If recruited to full war strength they would number 280,000 and 440,000 respectively, or a total of 720,000. For this army some 5000 medical officers would be required. In addition to this we have another army of 500,000 called to the colours for training, making a first line defence of 1,220,000 men. In addition, it is expected that at least a million and a half more troops will be called out during the year for training, making a total of 2,720,000 troops under arms. Such an army would require 19,000 medical officers. We now have in the regular army about 1200 medical officers and in the National Guard about as many more, making about 2400 officers, and leaving a deficiency of 16,600 medical officers to be supplied from civil life. In view of the fact that we have in the United States only 145,000 registered physicians, it will be seen that the new army will face a deficiency in a direction in which it will be difficult to improvise aid.

On the basis of the latest figures the number of registered medical men in the United States in 1916 was 145,241 and in the dependencies 1372, while the number of students qualifying during each of the last two years has been in the neighbourhood of 3000. With 3000 young men on the point of graduating and 2500 senior students, in addition to a large number of recently qualified men holding hospital appointments or just started in practices, the deficiency of 16,000 medical officers can in large part promptly be made good. The majority of these men will be in a

position to join one or other branch of the medical service, while senior men will be required to fill places in the special branches of preventive medicine which form an essential part of the modern medical service. Special arrangements have been made excusing senior students on enrolment the completion of their current term of study.

The whole medical service of the war will be carried on under the supervision of the Council of National Defence, a body created last August to secure the effective coördination of industry and material resources in the interests of national security and welfare. The Council consists of the Secretaries of State for War, the Navy, the Interior, Agriculture, Commerce and Labour, assisted by an Advisory Commission (nominated by the Council) of seven civilians appointed by the Federal President. Each member of the Commission appoints a committee or board representative of the activities for which he is responsible. The medical representative is Dr. Franklin H. Martin, who presides over a committee the other members of which are Surgeon-General William C. Gorgas, U.S. Army; Surgeon-General William C. Braisted, U.S. Navy; Surgeon-General Rupert Blue, Public Health Service; Colonel Jefferson R. Kean, Director-General of Military Relief of the American Red Cross; Dr. William H. Welch, member of the National Council of Research; Dr. William J. Mayo, chairman of the Committee of American Physicians for Medical Preparedness; Dr. Frank F. Simpson, chief of the Medical Section of the Council for National Defence and Secretary of the Committee of American Physicians for Preparedness. This medical committee owes its inception early last year to the joint action of the American Medical Association, the American Surgical Association, the Congress of American Physicians and Surgeons, the Clinical Congress of Surgeons of North America, and the American College of Surgeons. It has already done much excellent work, including the selection of some 20,000 medical men classified according to their training and the kind of work for which they are best fitted. In order to facilitate the examination of recruits and release officers of the regular Army from such work a board of officers from the Medical Officers Reserve will be in session at the New York Academy of Medicine to examine candidates for the medical services and initiate them in the details of this work.

The preparatory work of organising and equipping base hospital units was taken in hand by the American Red Cross some months ago, and 22 units are now ready for service at any moment, while 7 others are on the point of completion. Each hospital will contain 500 beds. There have been enrolled 3000 trained nurses for active service, and more than 1000 medical men, as well as over 4000 women with an elementary knowledge of first aid and hygiene, who will be able to assist the trained nurses. The first naval base hospital stationed at Brooklyn is equipped for 250 beds, and has been ordered to hold itself in readiness for active service.

The Rockefeller Institute is experimenting with a portable military hospital unit with accommodation for 200 patients to be used as a surgical clinic. It is proposed to place it in the charge of Dr. Carrel and Dr. Dakin to assist in the introduction of the methods of these surgeons as carried out in the French military hospitals.

THE WAR REFUGEES' DISPENSARY.

The Committee of the War Refugees' Dispensary, which has recently been closed, has sent in its final report to the War Refugees' Committee, of whose work it formed a branch and by which it was financed. Instituted in October, 1914, by four English and three Belgian doctors, with the assistance of a Voluntary Aid Detachment, this dispensary continued its activities at 265, Strand, London, W.C., as an out-patient department for refugees until early in the present year, when, owing to progressive difficulties both in staffing and financing, it was closed and the work handed over to the Government Dispensary in Sheffield-street, W.C. During the two-and-a-quarter years of its existence nearly 29,000 consultations and treatments were given with a daily average of 52 attendances. Medical cases predominated, but a considerable proportion of surgical, skin, nose, throat, ear, and other affections were dealt with. Patients to the number of over 400 requiring treatment beyond the scope of the dispensary were passed on to out-patient departments of suitable hospitals, and 124 placed as in-patients. Besides this over 1200 introductions for ophthalmic treatment were given, and 420 pairs of spectacles supplied free or partially free. Upwards of 1000 dental cases were treated by a private dentist, who most liberally and kindly placed his services at the disposal of the Committee, and nearly 500 received hospital treatment. Artificial teeth and repairs, free or assisted, were granted to 63 people, and in the same way nearly 600 surgical appliances have been provided. With a few exceptions medicines were dispensed on the premises, nearly 20,000 prescriptions having been made up, at an average cost of 4½*d.* each. As the whole of the English staff and some of the Belgian gave their services free, the dispensary was enabled to exist upon a comparatively modest income. The premises were kindly lent free of rent for some months, and then at a reduced rate; drugs were latterly one of the heaviest items of expenditure, costing £240 during 1916. The total expenses of the dispensary for the 27 months of its existence barely exceeded £1800. An important branch of the work was that of providing doctors to visit refugees who were too ill to come to the dispensary. In the earlier months there was a certain number of Belgian doctors available in London who could do this work, and when they were not available English practitioners visited the Belgian patients in their own neighbourhoods, but in view of the general shortage of doctors the provision of domiciliary treatment was always attended with difficulty.

THE TRAINING OF THE DISABLED SOLDIER.

Several weeks ago it was stated that the Ministry of Labour was collaborating with the War Pensions Statutory Committee in setting up Trade Advisory Committees, on which both employers and employed were to be represented, to deal with the training and employment of disabled men in various trades. In Lancashire, where a county authority is dealing with the same question, the movement has, up to the present, taken the form of collecting information from all the education authorities in the county with regard to the facilities which they would be able to offer for training men in various industries. This information has been tabulated and will shortly be circulated to all the Local Pensions Committees for their use. It is hoped that the whole of the cost will be met by the Pensions Ministry and that no education authority will hesitate to accept men from any part of the county.

MEDICAL MEN OF MILITARY AGE IN IRELAND.—The Council of the Irish Medical Association have passed the following resolutions:—

1. The Council of the Irish Medical Association consider that it is unfair and dangerous, from a public health point of view, for the authorities to refuse sanctioning temporary appointments of medical men of military age in the country, where the services of men over military age cannot be procured.
2. The Council of the Irish Medical Association consider that the military authorities are not consistent in their action in refusing to employ medical men over 50 years of age for foreign service, although active and energetic, and in some cases well known operating surgeons, while they have given military home work to many men who are of military age.

GERMAN TREATMENT OF BRITISH PRISONERS OF WAR: A SCOTTISH RESOLUTION.—The Faculties of Medicine of the Scottish Universities, together with the Presidents and Councils of the Royal College of Surgeons of Edinburgh and of the Royal Faculty of Physicians and Surgeons of Glasgow, have issued a resolution recording—

Their condemnation and detestation of the neglect and inhumanity which characterised the conduct of certain members of the Prussian medical staff to whom the treatment of British prisoners of war was entrusted, especially in the internment camps at Wittenberg and Gardelegen, during outbreaks of typhus fever which had been largely provoked by overcrowding, insufficient food, and entire absence of all sanitary measures. The facts as stated in the recent reports of a British Government Committee, which are based mainly on the testimony of officers of the Royal Army Medical Corps, themselves prisoners of war, are of such a nature as to bring indelible disgrace upon the medical men concerned and upon the German Government, which remains ultimately responsible for the treatment meted out to prisoners of war. As members of a profession which has hitherto, in every quarter of the civilised world, been inaccessible to the shameful influences which make for barbarity in warfare, we are reluctantly forced to the conclusion that a spirit of gross inhumanity has not been absent from the Prussian Medical Service.

NEW MILITARY HOSPITALS.—A Red Cross hospital is to be established on the Millbay recreation ground at Plymouth. The hospital will contain 200 beds, in tents, and some adjacent buildings have been lent and will be used as dining and recreation buildings. The work is nearly completed; the cost of the equipment is estimated at £1750,

which is being raised by subscription. The medical men on the staff of the institution are Mr. F. Down and Dr. G. S. Earl.—Bigadon House, Buckfastleigh, Devon, was formally opened for the reception of patients on April 2nd. The institution contains 50 beds, and patients will be sent there from the American Women's Hospital at Paignton.—The Hon. Mrs. Smyth has given Ashton Court, near Bristol, as a military hospital. It will accommodate 120 beds.—The Torrington Voluntary Aid Hospital was recently formally opened. It contains 10 wards with 65 beds, and an additional 10 beds could be provided, should the necessity arise.—Colonel James Craig, M.P., has placed his residence, Craigavon, at the disposal of the military authorities as a home for neurasthenic soldiers. It will be worked in connexion with the Ulster Volunteer Force Hospital.

RED CROSS GIFTS.—More than £200,000 have been collected in the United Provinces of India for the provision of transport for the wounded by the Special War Fund inaugurated last year by Sir James Meston, Lieutenant-Governor of the United Provinces.—The Imperial Order of the Daughters of the Empire, Illinois, have sent a gift of £2000, and New Zealand has sent through the High Commissioner a sum of £963.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates were successful:—

Surgery.—H. W. Diggett, (Sections I. & II.), Philadelphia and London Hospital; D. H. Hearn (Section I.), Durham; T. F. Reason (Sections I. & II.), St. Mary's Hospital; F. A. Unwin (Section I.), Westminster Hospital; and L. J. Vincent (Sections I. & II.), Cambridge and St. Mary's Hospital.

Medicine.—G. W. Coombes (Sections I. & II.), London Hospital; F. A. Unwin (Section II.), Westminster Hospital; and C. G. G. Winter (Sections I. & II.), St. Mary's Hospital.

Forensic Medicine.—G. W. Coombes, London Hospital; and W. H. A. Pratt, Guy's Hospital.

Midwifery.—C. A. W. Chapman, Sheffield.

The Diploma of the Society was granted to the following candidate entitling him to practise medicine, surgery, and midwifery: C. G. G. Winter.

THE LATE JAMES HENTHORN TODD CONNOR, M.R.C.S., L.S.A.—The death of Mr. J. H. T. Connor took place at 1, Mulberry-walk, Chelsea, on April 16th, at the age of 75 years. He was the fourth son of Dr. William Connor, of New Wandsworth, whom he succeeded in practice, and a nephew of Professor Robert Bentley Todd, F.R.S. He was educated at King's College School and Hospital, where he was dresser to Sir William Fergusson. For many years he had an extensive general practice in New Wandsworth and its neighbourhood, holding various public appointments, including that of medical officer to the Battersea Training College. He leaves a wife and four children. His eldest son is Mr. Bentley Connor, whose portrait of the King has commanded attention.

MEDICAL MAGISTRATE.—Mr. Charles George MacVicker, B.A., M.B., B.Ch., B.A.O. R.U.I., has been placed on the commission of the peace for the county of Somerset.

THE LATE SIR JOHN HOWARD.—The name of Sir John Howard, the engineer philanthropist, who died on April 20th in his eighty-seventh year, is perpetuated in Brighton by two benefactions—the Howard Convalescent Home at Black Rock, which he built and endowed at a cost of £40,000 for ladies of limited means, but which on the outbreak of the war was handed over to the War Office for wounded soldiers, and a scheme for the building and endowing, at an outlay of £30,000, of 24 cottages as cottage homes for incapacitated nurses in memory of Nurse Cavell. He had previously founded the Howard Charity, which provides regular weekly assistance to a large number of old people.

DONATIONS AND BEQUESTS.—By will the late Mrs. Sarah Clayton Dawson, Upper Norwood, S.E., left £1000 each to the Convalescent Home, Enys-road, Eastbourne, and the London Homœopathic Hospital, and £450 to the Medical Missionary School in connexion with that hospital.—The late Miss Isabel Marion Briscoe, of Codsall, Staffordshire, has left £500 each to the Wolverhampton and Staffordshire General Hospital and the Wolverhampton and District Hospital for Women, £100 each to the London Hospital and the Brompton Consumption Hospital, and £50 to the Wolverhampton district branch of the Queen Victoria Nursing Association.—By will the late Mr. Thomas Wharrie, of Eton-avenue, Hampstead, N.W., has left £1000 each to the Royal Infirmary, Glasgow, the Western Infirmary, Glasgow, the Victoria Infirmary, Glasgow, the East Park Home for Infirm Children, and the Higginbotham Sick Poor Nursing Association.—The late Mr. Ernest Penrose Arnold, of Stilemans, Godalming, has by will made a large bequest to the Children's Sanatorium at Holt, Norfolk, or other sanatorium for the poor to be selected by his executors.

THE LATE CHARLES SINCLAIR THOMPSON, M.B., C.M. EDIN.—Dr. C. S. Thompson, consulting surgeon to Bideford Infirmary, died at his residence, Bideford, Devon, on April 9th. The deceased, who succeeded his father, had practised in Bideford and the district for over 40 years, retiring from active work a year ago. He was on the honorary surgical staff of the Bideford Infirmary and held appointments under the Bideford union for 35 years. Dr. Thompson, who was greatly respected in Bideford, leaves a widow and one son, a lieutenant in the Royal Engineers.

Dr. James Bertie Simpson has been appointed a deputy lieutenant of Sutherland.

CENTENARIANS.—Miss Charlotte Carlyon, who was born on Feb. 16th, 1815, died at Truro recently. Her cousin, Rev. P. Carlyon, died a few years ago at Falmouth, in his 103rd year.—Mrs. Eleanor Plaistowe died recently at Highgate, aged 102 years.

THE LATE DR. H. P. POTTER.—Henry Percy Potter, M.D. Durh., F.R.C.S. Eng., L.S.A., D.P.H. Cantab., who for 37 years was medical superintendent of the Kensington Infirmary, died on April 9th at the age of 63 years. He received his medical education at St. Thomas's Hospital and in Paris, qualifying L.S.A. in 1875. Three years later he obtained the F.R.C.S. Eng. by examination, and in 1893 he graduated M.D. at Durham University. He was also a D.P.H. of Cambridge. After holding house appointments at St. Thomas's Hospital he took up the resident appointment at the Kensington Infirmary which he held until his death. At one time he was president of the West London Medico-Chirurgical Society. Dr. Potter made several contributions to medical literature, the more important being a treatise on Gonorrhœal Rheumatism, its Nature and Treatment, published in 1878, and an account of the natural history of the "Voyage of the *Sunbeam*."

Parliamentary Intelligence.

HOUSE OF COMMONS.

THURSDAY, APRIL 19TH.

Health of Salonika Forces.

Answering Mr. DILLON, who asked what precautions were being taken to safeguard the health of the Army in the neighbourhood of Salonika during the summer months, Mr. BONAR LAW said: I can assure the House that the Government are fully alive to the difficulties and dangers in connexion with this matter, and are taking all possible steps.

Deaths at Kinmel Park Camp.

Mr. HAYDN JONES asked the Under Secretary for War what was the number of deaths amongst soldiers at Kinmel Park Camp, Rhyl, for the months of February and March and the causes of such deaths.—Mr. MACPHERSON replied: The answer is as follows:—

February: 1 officer, 15 men: Pneumonia 7, bronchitis 4, pleurisy 2, motor accident 1, died at Abergele of syncope 1, found dead in quarters (an officer) 1. March: 1 officer, 17 men: Pneumonia 6, cerebro spinal meningitis 4, bronchitis 1, pneumococcal meningitis 1, meningitis 1, dilated heart 1, hemiplegia 1, cancer of stomach 1, under anæsthetic 1, bomb wounds (an officer) 1.

Artificial Limbs for Disabled Soldiers.

Replying to Major CHAPPLE, Mr. BARNES (Minister of Pensions) wrote: A committee of experts exists for the purpose of advising as to the most suitable types of limbs for disabled soldiers, and as to the prices that should be paid for them. If it advises that the prices asked by the manufacturers are excessive, the question of a Government factory will be considered, but the main consideration which I have in view is not the cheapness of the limb but its efficiency.

Tuberculosis Treatment in County Meath.

Mr. P. WHITE asked the Chief Secretary for Ireland why the application of the Meath county council for £347 10s. (it being the only money received from the Treasury for the treatment of tuberculosis) had not been granted this year, as similar estimates were since the passing of the National Health Insurance Act, 1911; and whether the granting of the amount was recommended by the Local Government Board for Ireland.—Mr. DUKE wrote in reply:

The Treasury decided not to sanction this grant on the advice of the Local Government Board for Ireland, with which the Irish Insurance Commissioners agreed, that the arrangements for the treatment of tuberculosis in county Meath were not satisfactory.

MONDAY, APRIL 23RD.

Calling up Medical Men.

Mr. BROOKES asked the Under Secretary for War whether, in order to prevent difficulties arising by the withdrawal of medical service in any area, Insurance Committees or other authorities responsible for the public health would be allowed a right of appeal against the recent order calling up medical men similar to that accorded to individuals.—Mr. MACPHERSON replied: Each individual affected by the Military Service Acts has the right of appeal, and a medical man can appeal to a tribunal, who will refer his case to the Central Medical War Committee. The procedure as to the action which an Insurance Committee or other authority may take is being discussed by the departments concerned.

Venereal Disease Bill.

Mr. HAYES FISHER (Parliamentary Secretary to the Local Government Board) moved the second reading of the Venereal Disease Bill, the object of which is to prevent the treatment of venereal disease otherwise than by duly qualified medical practitioners and to control the supply of remedies therefor. The Bill has already passed through the House of Lords.[1] He said that the Bill was not a war measure. It, however, had this connexion with the war, that as the Royal Commission on Venereal Diseases reported, and as experience showed, after war outbreaks of venereal disease were likely to occur to men in districts which had been comparatively free from it. Although this Bill had been introduced he did not wish the House or the country to jump to the conclusion that there was any increase in this formidable disease. Except in regard to the Army, the Navy, and the police, there were no statistics available to show the extent of the disease, but if the deaths due to syphilis were taken the evidence would lead to the conclusion that the disease was stationary, or at all events it was not increasing. So far as the figures could be obtained, there was nothing to show that the ratio per 1000 in the Army had in any degree increased. But it was not necessary to try to prove any increase in the prevalence of venereal disease in order to prove the case for the Bill. Its prevalence was quite formidable enough. In 1916 there were 36,500 cases treated in the London Lock Hospital alone, and these had increased from 23,074 cases in 1913. As a result of the report of the Royal Commission, Mr. Long, when he was President of the Local Government Board, had circularised local authorities asking them to establish centres for the scientific diagnosis of the disease and for free and complete treatment. Ninety-nine out of the 145 local authorities who had been thus circularised had submitted schemes, and 61 of those schemes applying to a population of 19 millions had been approved.

Mr. KING: How many of the schemes are in actual operation?

Mr. HAYES FISHER: Most of them are in operation. Take the case of London. He had only the figures relating to six hospitals for the first three months of this year, and in them 1195 males and 350 females had been treated as new patients. It was remarkable in these times, when there was such pressure on hospitals and on the medical profession, that they had been able to submit practical schemes. He had great hopes that these schemes would rapidly mature and that the results from them would be, perhaps not all that could be possibly expected, but would be very substantial in gradually diminishing the prevalence of these diseases. The policy which was being adopted could be described as the maximum of persuasion with the minimum of penalty.

Need for Legislation.

Why, then, was legislation required? It was necessary as a complement to administrative action, and it would hasten the operation of that action. A policy was wanted to persuade the victims of these diseases to abandon quack methods of treatment and go to the centres where they would get sound and scientific methods of treatment. It was desirable to prevent the treatment of these diseases by methods which were specious, fallacious, and, indeed, pernicious. The Bill prevented the treatment of the disease otherwise than by a duly qualified medical practitioner, or the dispensing of any remedy except on the prescription of a medical man. Persons suffering from venereal diseases were a menace to the health of the community. Although the Bill rested on persuasion of the sufferers to seek proper treatment, that policy was retarded and hindered if they did not prevent quacks from carrying on their trade. The liberty of the individual had constantly to give way to the safety of the State. All statutes for the compulsory notification of infectious diseases interfered with the liberty of the individual, and this infringement of the liberties of the subject in this case was proposed to preserve the greater liberty of the community. The Royal Commission had no hesitation in stating that the effects of the unqualified practice as regarded venereal disease were disastrous. He was quite conscious of the limitations of the Bill, but in this campaign against venereal disease all forces—educational, moral, and spiritual—had to be brought to bear. In passing the Bill Parliament would be providing the country with legislation which was ancillary to the policy of persuasion.

Criticism of the Bill.

Mr. KING thought that the Bill should have been postponed until centres for free treatment were in operation in every part of the country. He deprecated any step which would confer a monopoly on salvarsan treatment at this stage.

Captain GUEST, whilst he supported the second reading, considered that the Bill did not go far enough to cope with the magnitude of the evil caused by venereal diseases. He went on to deal with the seriousness of these diseases in the Army. The Under Secretary for War had stated recently that the ratio was 43 per 1000. But in the aggregate that meant a very large total. Since the war began there had been admitted to hospitals in England over 70,000 cases of gonorrhœa, over 21,000 cases of syphilis, and over 6000 cases of soft chancre. All these men might with few exceptions be regarded as unfit for further military use. He thought that it would be no exaggeration to say that during the course of the war between 40,000 and 50,000 cases of syphilis and between 150,000 and 200,000 cases of gonorrhœa had passed through the hospitals in France. This showed how great was the magnitude of the evil and how ineffective were the proposals of the Bill for dealing with it. In his view two measures were necessary—the removal of temptation to the soldier and the subjection of civilians to compulsory detention and cure.

Sir WILLIAM COLLINS said that he could not help thinking that the legislative efforts of the Government had not been so fortunate as their administrative efforts. He was not quite sure—although he entirely agreed that the practice of the quack in cases of venereal disease was most pernicious and objectionable and from every medical and surgical point of view to be condemned—that he desired adventitious protection for the profession against the kind of practice which ought to carry its own condemnation. There was also the case of the tuberculosis quack and the cancer quack. He was not at all sure that the tuberculosis quack was not more shameful than the quack with whom they were now concerned, and that the cancer quack was not worse than either. If Parliament was going to put down unqualified practice at all, it would be better to put it down altogether rather than deal with this particular corner of it alone. At the same time he wished to recognise that the practice of medicine, though a science, was not an exact science, but a progressive science, and a science which should look for new life from any quarter from which it might proceed. The profession suffered rather than gained by association with the policeman and the gaoler in enforcing this prohibition, and he would rather see it rest on its own merits.

Mr. GLYN-JONES said that if the provisions of the Apothecaries Act were enforced against unqualified people who were to-day dealing with venereal disease nine-tenths of the evils which the present Bill was intended to hit would be removed. These provisions were not enforced. The Bill conferred on medical practitioners privileges which were not already possessed by them. The Bill was confined to venereal diseases, and it provided that the treatment should for the first time by law be limited to the medical profession, whilst allowing doctors, when treating other than insured persons, to buy and sell for profit to their patients any drugs or appliances which they might require. The pharmacists were not claiming too much when they said that if members of the medical profession were given the sole right to prescribe for patients who could not get treatment anywhere else the patients were driven to them, and the sole right carried with it the ability to usurp the functions of another profession and to make a profit out of buying and selling the remedies which were supplied to those patients.

Mr. DILLON considered that the Bill and the Criminal Law Amendment Bill were rather bad specimens of panic legislation. In his opinion the way to deal with the subject would have been to go at it first from the moral and economic side, and also to have set up a Ministry of Health, the necessity for which, he rejoiced to observe, had at last dawned upon the people of this country.

Sir H. GREENWOOD spoke of the number of Canadian troops who had gone through hospital for venereal disease. He hoped that steps would be taken to deal with such a situation, and that the Bill would go rapidly through the House of Commons. It was an earnest effort to deal with a disease which was largely due to lax administration in the past.

After some further consideration the Bill was read a second time.

[1] THE LANCET, 1917, i., 431.

TUESDAY, APRIL 24TH.

Public Health Administration in Scotland.

Mr. MACCALLUM SCOTT asked the Secretary for Scotland whether the recent utterances of the President of the English Local Government Board with regard to the establishment of a Ministry of Health had any application to Scotland; whether he had had under consideration any proposals which would involve the local administration of public health in Scotland from the town and county councils which were at present charged with it; and whether, before any such proposals were adopted, he would afford ample opportunity for their discussion in the bodies affected.—Mr. MUNRO replied: Although my noble friend's speeches have not referred to Scotland, any proposals affecting the machinery of government in relation to public health and its administration, of course, interest Scotland as well as England. I have received various suggestions in the matter which will receive my consideration. It is clear that any proposals implying such a change as my honourable friend describes could only receive effect by means of legislation which would afford ample opportunity of discussion.

Cocaine in Dentistry.

Mr. RAFFAN asked the Under Secretary for the Home Department whether it was proposed to extend the permit to unregistered practitioners in dentistry to use preparations containing not more than 1 per cent. of cocaine for a further period upon its expiry on April 30th; and, if so, to what date such extension would apply.—Mr. BRACE answered: The existing exemption will be extended for a further period of three months, and an Order will be made accordingly.

WEDNESDAY, APRIL 25TH.

Public Health Legislation in Ireland.

Mr. ARTHUR SAMUELS asked the Chief Secretary for Ireland (1) whether, with a view to the better and more economical enforcement of regulations by the Local Government Board in regard to epidemic and infectious diseases in Ireland, he would introduce a Bill extending the provisions of the Public Health (Prevention and Treatment of Disease) Act, 1913, to Ireland; and (2) whether, having regard to the representations of the medical profession in Ireland and the desirability of securing skilled treatment in cases of child-birth by properly qualified midwives, he would introduce a Bill for Ireland at an early date framed upon the lines of the English Midwives Act of 1902 and the Scotch Midwives Act of 1915.—Mr. DUKE answered: Bills have been drafted for the purposes mentioned in both these questions.

Calling up Medical Men.

Mr. PRINGLE asked the Chancellor of the Exchequer whether notices had been issued to all medical men of military age to report themselves for service at 9 A.M. on April 26th; whether the doctors so called up were to be required immediately to accept commissions and to be ready to join for service at 48 hours' notice on or after May 6th; whether in the case of doctors who refused to apply for commissions the recruiting officers were instructed to enlist them as privates in the R.A.M.C.; whether in view of these instructions steps were being taken for securing that the essential needs of the civil community were met in order that a serious breakdown in the medical service might be averted.—Mr. BONAR LAW replied: The calling up of these doctors is necessitated by the attacks on hospital ships, but the danger of the civil population being left without doctors is fully realised, and though all doctors of military age have been formally called up they will only be taken after consultation, which is now taking place between the Local Government Board and the National Health Commissioners.

Mr. PRINGLE: Will the right honourable gentleman give an assurance that where a man is willing to accept a commission, even if he accepts it, he will not be taken away without consultation with those authorities?—Mr. BONAR LAW: That is the substance of the answer I have given. The whole subject is being considered from all these points of view.

Sir W. ESSEX: Will the right honourable gentleman consider the subject of replacing these medical men by others who will be presently liberated from employment owing to the probable closing up of military hospitals in this country in consequence of the transference of patients?—Mr. BONAR LAW: The National Health Insurance Commissioners and the Local Government Board are fully alive to that, and realise that the problems can only be satisfactorily met if men over military age will undertake part of the duties.

Commander WEDGWOOD: Will the right honourable gentleman see that the Ministry of Munitions is also consulted on the question, seeing that doctors are very important in connexion with the manufacture of gas and in connexion with steel works?—Mr. BONAR LAW: I can assure the House that the whole subject is being thoroughly gone into from the point of view of making the best use of the material available. In the view of the Government, and I am sure that it is the view of the House also, the wounded must have the first claim.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BOURNEMOUTH, ROYAL VICTORIA AND WEST HANTS HOSPITAL, Boscombe Branch.—House Surgeon. Salary £125 per annum and extras, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

BURY AND DISTRICT JOINT HOSPITAL BOARD.—Assistant to Medical Superintendent. Salary £250 per annum, with board, &c.

CAMBERWELL INFIRMARY, Brunswick-quare.—Two Locum Tenens Assistant Medical Officers. Salary £7 7s. weekly, each with board, &c.

CHESTER ROYAL INFIRMARY.—Assistant House Surgeon. Salary £150 per annum, with board, &c.

DERBY, DERBYSHIRE ROYAL INFIRMARY.—Two House Surgeons. Salary £200 per annum, with board, &c.

GREENWICH UNION INFIRMARY AND WORKHOUSE.—Assistant Medical Officer, unmarried. Salary £200 per annum, with apartments, rations, &c.

HARROGATE INFIRMARY.—Resident House Surgeon.

KENT COUNTY COUNCIL.—Tuberculosis Officer. Salary at rate of £500 per annum.

LEEDS PUBLIC DISPENSARY.—Second Female Resident Medical Officer. Salary £200 per annum, with board, &c.

LEICESTER ROYAL INFIRMARY.—Two Resident Surgical Officers. Salary £250 per annum, with apartments, &c.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W.—Temporary Anæsthetist two days a week for about two or three hours. Salary 25 guineas per annum.

MANCHESTER, ANCOATS HOSPITAL.—House Physician. Salary £200 per annum, with board, &c.

MANCHESTER, BAGULEY SANATORIUM FOR TUBERCULOSIS.—First Assistant Medical Officer, unmarried. Salary £330 per annum, with board, &c.

MANCHESTER, CITY OF.—Temporary Assistant Tuberculosis Officer. Salary £400 per annum.

NOTTINGHAM CHILDREN'S HOSPITAL.—Female House Surgeon. Salary at rate of £200 per annum, with board, &c.

NOTTINGHAM CITY ASYLUM.—Locum Tenens. Salary £7 7s. per week, with board, &c.

NOTTINGHAM GENERAL HOSPITAL.—Two Assistant House Surgeons for six months. Salary at rate of £250 per annum each, board, &c.

NOTTS COUNTY COUNCIL.—Second Assistant Tuberculosis Officer. Salary £400 per annum.

PRESTON ROYAL INFIRMARY.—Resident Medical and Surgical Officer. Salary £120 per annum, with board, &c.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green.—Temporary Anæsthetist. Salary £50 per annum.

RHONDDA URBAN DISTRICT COUNCIL.—Dental Surgeon. Salary £300 per annum.

ROCHESTER, ST BARTHOLOMEW'S HOSPITAL, Kent.—Senior Resident House Surgeon. Salary at rate of £300 per annum, with board, &c.

ROTHERHAM HOSPITAL.—Junior House Surgeon. Salary £150 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SOUTH LONDON HOSPITAL FOR WOMEN, South Side, Clapham Common, S.W.—Female Anæsthetist on Tuesday afternoons. Salary 10s. 6d. per attendance.

WESTERN GENERAL DISPENSARY, Marylebone-road, N.W.—Honorary Ophthalmic Surgeon.

WEST RIDING OF YORKSHIRE.—Two Temporary School Medical Inspectors. Salary £320 per annum.

Births, Marriages, and Deaths.

BIRTHS.

LEWIS SMITH.—On April 18th, at Bank House, Pembroke Dock, the wife of Surgeon F. Lewis Smith, R.N., of a daughter.

REYNOLDS.—On April 4th, at Shameen, Canton, China, the wife of Dr. W. Graham Reynolds, of a son.

WALTON.—On April 23rd, at Devonshire-street, W., the wife of A. J. Walton, F.R.C.S., of a son (still-born).

MARRIAGES.

CLEMENTS—JONES.—On April 17th, at St. Hilary's Church, Wallasey, Captain William Leitrim Clements, R.A.M.C., to Dorothy Melangell, only daughter of the late Rev. Owen Jones, Rector of Nantglyn, Denbigh, and niece of Mrs. W. R. Roberts, of Rolleston-drive, Wallasey.

CRAWFORD—JACKSON.—On April 17th, at Cloves Parish Church, Vincent James Crawford, D.S.O., Lieutenant-Colonel, R.A.M.C., to Ellen Kathleen (Eileen), eldest daughter of the late Samuel K. Jackson and Mrs. Jackson, Cara, Cloves, co. Monaghan.

DEATHS.

MARTIN.—Killed in action on April 9th, Captain T. W. Martin, R.A.M.C., M.C., attached Royal Scots.

SADLER.—Killed in action on April 17th, Captain Vyvyan Kendall Sadler, R.A.M.C., aged 38.

SCUDAMORE.—On April 17th, after a short illness, Lieutenant L. G. Scudamore, R.A.M.C.

WEAVER.—Killed (the result of a riding accident) at Curragh Camp, Ireland, on April 20th, while serving as Captain R.A.M.C., John James Weaver, M.R.C.S. Eng., L.S.A., D.P.H. Camb., Medical Officer of Health for County Borough of Southport, elder son of the late James Weaver, M.D., of Southport, aged 56.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

SALT IN THE DIET.

Mr. William Mugfur, of Colan, Cornwall, who is in his 100th year, and who is probably the oldest active farmer in England, recently informed a correspondent of the *Daily Express* that, in his belief, to eat plenty of salt was a good thing if one wanted to live to a good old age. The use of salt in the diet has always been more or less a controversial matter. In 1748 a scientific experimenter, Dr. William Brownrigg, of Cumberland, published a valuable book on the "Art of Making Common Salt." In 1822 the author of the "Art of Invigorating and Prolonging Life," who disguised himself as "The Author of 'The Cook's Oracle,'" but who is known to have been Dr. William Kitchiner, famous for his dinner parties, stated in his quaint little book that—

"Salt is *allorum condimentorum, condimentum*, and the most salubrious and easily obtainable relish which Nature has given us to give sapidity to other substances; and has this advantage over all other Sauces, that if taken to excess—it carries its remedy with it in its aperient quality." He adds: "We suspect that most mischief is done by the immoderate and constant use of the Common Condiments. We have seen some puritanical folks who are for ever boasting that they never touch Made Dishes, &c. (one would suppose they had the Tongue of Pityllus), so be-devil every morsel they put into their Mouth—with Pepper and Mustard, &c., that they made their common food ten times more piquante—than the burn-gullet Bonne Bouche of an eastern Nabob, or a Broiled Devil, enveloped in veritable Sauce d'Enfer."

Dr. Kitchiner includes the following footnote explaining the allusion to the Tongue of Pityllus:—

"This gentleman had so cold a Stomach (saith Suidas), that he made a sheath for his Tongue, that he might swallow down his Pottage scalding hot; yea, I myself have known a Shropshire Gentleman of the like quality." (This footnote seems to have been extracted from Dr. Muffett on Food, 4to, 1655, p. 287.)

In 1699 England imposed a duty on salt which was revived on the motion of Sir Robert Walpole in February, 1732, increased to 15*s.* a bushel in 1805, reduced to 2*s.* in 1823, and abolished in 1825. Salt for the fisheries was free of duty. In the "eighties" there arose again a good deal of controversy in this country as to the injuriousness of eating common salt, and a book on the History of Salt was published in 1881 by Mr. E. M. Boddy, F.R.C.S., to uphold the eating of salt, but some of his arguments in its favour were thought by reviewers to be too enthusiastic. However, in 1883, THE LANCET referred editorially to the popular statements as to the injuriousness of common salt and commended its judicious use. Books condemning the use of salt have also been published by industrious compilers of public opinion on the subject. Salt and saltless diets have been both recommended with some amount of strenuousness, but Dr. Kitchiner's quotation from Colman may be referred to here:—

"Man differs more from Man
Than Man from Beast."

In THE LANCET of 1907, under the title of "Chloride of Sodium in Heart Disease," we quoted the opinion of an author who asserted that the average individual consumed far too much salt, and we then said that—

"Many people imagine that salt is a prophylactic against ill-health and that they cannot well consume too much of it. With delicate people, however, the habitual ingestion of more salt than is required by the system is sure to produce ill effects. The amount of salt that can be consumed daily with safety depends upon the constitution of the individual."

Years ago medicinal treatment was tried by many medical men of administering sodium chloride in cholera, phthisis, typhoid and other fevers, and in parasitical diseases. The most favourable results seem to have been obtained in the treatment of fevers by administering graduated doses. In more recent times common salt is claimed to be beneficial in leprosy, but deleterious in epilepsy and in diseases of the kidney. In 1902 THE LANCET commented on the question whether 80 grains of salt per gallon in potable waters and for domestic supply purposes was objectionable. On the whole the idea that salt prolongs life is a fallacy, but the opposite view is sure to be held by not a few who studiously avoid it as an addition to diet.

THE DRINK QUESTION.

IN common with other countries England has been compelled to safeguard the efficiency of its army by the drastic regulation of the sale of intoxicants. The two burning questions of the moment, State purchase and the nationalisation of the liquor traffic, are discussed in *The Alliance Year Book and Temperance Reformers' Handbook for 1917* (edited by G. B. Wilson, B.A. Lond., Howard Medalist, Royal Statistical Society; published in London and Manchester by the United Kingdom Alliance, price 1*s.* net) by the Rev. Principal Denney, D.D., and Mr. Edward Wood, J.P., respectively. The editor contributes an article on Alcoholic Liquors and Foodstuffs, while short notes deal with the food-supply of the United Kingdom, prohibition, and the liquor trade finance. Figures and diagrams supplement a formidable array of facts.

A KIDNEY AND ABDOMINAL PROTECTOR.

Dr. John Campbell, of Belfast, has called our attention to a garment to protect the lower part of the trunk designed by Lady Angela Adair, of Dunadry, Co. Antrim, and consisting of a shaped band of flannel about 36 inches long and 12 inches wide at the waist, with a narrower band passing between the thighs, which can be readily adjusted. The designer believes that the protector will prove useful in preventing exposure to cold, and that it will add to the comfort and health of those who wear it. The makers are Messrs. Robert McBride and Co., of 20, Alfred-street, Belfast.

ECONOMY IN RUBBER GLOVES.

Messrs. W. & A. Bates, Limited, of St. Mary's Mills, Leicester, have written with reference to the letters which have appeared on this subject, and have sent us some actual figures of the saving effected by some of the hospitals which send their damaged gloves to be repaired by the electric vulcaniser.

—	Gloves repaired during 12 months.	Cost of repairs.
		£ s. d.
London Hospital, Whitechapel road	1281	18 7 3
1st Eastern General Hospital, Cambridge ...	1741	28 4 0
War Hospital, Croydon	864	15 3 2
District Infirmary, Ashton-under-Lyne ...	563	10 2 6
3rd London General Hospital, R.A.M.C., Wandsworth	593	9 0 10
Queen's Hospital, Birmingham	950	17 8 6

Total gloves repaired during 12 months.	Total cost of repairs.	Cost of same number of new gloves at an average price of 2*s.* per pair.	"Apparent" or maximum saving effected.
6042	£98 6*s.* 3*d.*	£302 2*s.* 0*d.*	£203 15*s.* 9*d.*

Hospitals which send all their damaged and worn-out gloves to this firm for repair receive scrap prices for any gloves which are considered to be past repair.

"MONKEY" NUTS AS A FOOD.

To the Editor of THE LANCET.

SIR,—There seems to be now an increased sale of "monkey" nuts, and I observe that the price, which in peace time was 1*d.* a pint, has now reached 3*d.* a pint in some places. I bought a pint of these nuts and found that in the shells they weighed 5 oz. and the yield weighed 3¼ oz. At 3*d.* a pint this equals 1*s.* 3*d.* per pound for the "nuts," and at 2*d.* a pint equals 10*d.* a pound. In some places they are sold at 6*d.* a pound shelled. I ground up the seeds, of which there are one, two, or three in the shell, in a mincer, and mixed the minced nuts with an equal quantity of flour and a little sugar and baked as a flat cake. I have come to the conclusion that 1 part of nuts to 3 parts of flour would have been better, as the cake was too oily and rich and produced in three people a slight feeling of nausea and a desire to drink half a pint of water immediately. I have also eaten the peanuts unbaked and experienced the same urgent desire to drink. I remember seeing installed on the counter in London licensed victuallers' establishments a few years ago what were, I believe, American machines like urns for supplying by a penny-in-the-slot arrangement a small quantity of these "nuts" shelled. There seems to have been method in this attention paid to customers. In grinding up the nuts a moderate quantity of clear thin oil is obtained, something like olive oil. I learn that this arachis oil is used in the East instead of olive oil in cooking and for making ointments, liniments, and plasters, and as a substitute for cod-liver oil. The name *Arachis hypogœa*, which is interpreted as "without a backbone" and "under the earth," refers to the strange power of the plant of forcing the fruit or pods as they increase in size into the earth, where they ripen their seeds, thus accounting for the English names of "ground-nut" and "earth-nut," and sometimes "pea-nut" and "underground kidney-bean." The shells, when ground up in a small mill or mincer, make a very light-weight dry bran-like substance, which answers well for stuffing cushions instead of bran. I have seen public places strewn with "monkey" nut shells, but they could be made use of in this

way. When immersed in boiling water some of the ground shell sinks and some floats, but it does not dissolve.

I am, Sir, yours faithfully,

London, April 16th, 1917. OBSERVER.

*** Another South American name for the "monkey" nut is "Cacahuate," which evidently accounts for the common French names of "Cacahuète" and "Cacahuate," although other French names are "Arachide" and "Pistache de terre." The German names are "Erdnuss," and for the oil "Katjangöl," evidently a corruption of the East Indian Katchung oil. It is also claimed that from these oily nuts a kind of inferior chocolate may be made; the oil, however, is said not to "keep" well, but soon to become rancid.

In a recent handbook on Brazil by J. C. Oakenfull is the following paragraph:—

Pea-nuts (*Amendoim*). These kernels yield 50 per cent. of oil, and the shells contain 85·48 per cent. of cellulose. The residue of the crushed nuts forms an excellent feeding cake for cattle, containing more than 31 per cent. of albuminoids, 11 per cent. of oil, and 31 per cent. of starch and saccharine matter. The plant thrives only in a limestone district, or in soils where an abundance of calcareous matter has been added. It should be planted in rotation with tubers or maize. In favourable circumstances 2½ tons of nuts to the acre is not an out-of-the-way crop. —ED. L.

"MEDICAL PRACTITIONERS AND IMPERFECT OPERATIONS."

UNDER the above heading the *Western Morning News* has quoted recently the report of Mr. J. F. Fry, in reference to tonsils and adenoids in the Exeter division, presented by him to the Devon Education Committee:—

I am convinced that the school medical inspector should, with regard to all defects, only send notices to parents in those cases where the deficit is so very marked that the medical attendant cannot do otherwise than endorse the verdict. There is an undoubted disinclination on the part of many practitioners to fall foul of the school medical inspector if possible. In four or five instances parents complained that my promise was not fulfilled, as their children had not benefited by the operation, and the result was that all other cases refused treatment in those places. Examination showed that the local practitioner in one case had taken a small slice of the tonsil, in another had removed one tonsil only, and had not touched the adenoids. The moral is, that while some general practitioners remove tonsils and adenoids as well as a specialist, it would be wiser that all cases should be treated by a skilled operator, and I think that all ought to go to hospital.

I.M.S. (P. & O. S.N. Co.) is thanked for his communication but has omitted to enclose his card.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Thursday, May 3rd.

OBSTETRICS AND GYNÆCOLOGY (Hon. Secretaries—H. Russell Andrews, T. G. Stevens): at 8 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1917-1918.
Specimens:
Mr. Gordon Ley: Spontaneous Rupture of Uterus.
Mr. T. G. Stevens: Decidual Reaction in a Polypus.
Short Communication:
Mr. Gordon Ley: Decidual Reaction in a Uterine Fibroid.
Papers:
Mr. J. D. Malcolm: Post-operative Tympanites: its Nature, and Some Points in its Treatment.
Dr. Cuthbert Lockyer: Ovarian Pregnancy.

Friday, May 4th.

LARYNGOLOGY (Hon. Secretaries—Cecil I. Graham, Frank A. Rose): at 4 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1917-1918.
Cases and Specimens:
Mr. Mark Hovell: (1) The Treatment of Irritative Coughing; (2) Retainers of Tracheotomy Tubes.
Mr. E. D. D. Davis: Two Cases of Optic Neuritis caused by Nasal Disease.
Mr. G. W. Dawson: (1) Naso pharyngeal Fibroma; (2) Adherent Palate; (3) Congenital Atresia Naris.
Dr. Watson-Williams: Recent Methods of Nasal Diagnosis illustrated.
Mr. W. M. Mollison: (1) Osteomyelitis of Frontal Bone; (2) Carcinoma Maxillæ after Operation.
Dr. Donelan: Specimen of Epithelioma removed from the Vocal Cord.
Mr. Tilley: Skiagram of Pituitary Fossa and Notes upon Removal of New Growth.
Dr. Dan McKenzie: Spasmodic Stricture of Thoracic Œsophagus; Skiagrams.

RÖNTGEN SOCIETY, at the Cancer Hospital (Free), Fulham-road, S.W.
TUESDAY.—8.15 P.M., General Meeting. Adjourned Discussion on the Future of the British X Ray Industry (continued by Capt. T. Holland (President)). Mr. A. S. Esslemont, Dr. J. Metcalfe, Mr. P. J. Neate, Mr. F. W. Higgins, Mr. W. R. Bullimore, Mr. A. E. Dean, Mr. B. H. Morphy, Mr. W. B. Schall, Mr. J. H. Webb, Mr. H. C. Head, and Dr. R. Knox will take part in the discussion.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.
WEDNESDAY.—4.30 P.M., Paper:—Mr. J. C. Shenstone: Herb-Growing in the British Empire: its Past, Present, and Future.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY, West London Hospital, Hammersmith-road, W.
FRIDAY.—8.30 P.M., Meeting.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East.
TUESDAY AND THURSDAY.—5 P.M., Oliver-Sharpey Lectures:—Dr. C. Bolton: Observations on the Pathology of Cardiac Dropsy.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
Museum Demonstrations (Pathology) for Medical Students and Practitioners and First-Aid and Ambulance Students:—
MONDAY.—5 P.M., Mr. S. G. Shattock: Gunshot Injuries.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W
TUESDAY.—3 P.M., Prof. C. S. Sherrington: Tetanus: its Prevention, Symptoms, and Treatment. (Lecture I.) 5 P.M., Annual Meeting.

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Ha of the Institute, 37, Russell-square, W.C. 1.
Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—
WEDNESDAY.—4 P.M., Lecture III.:—Dr. C. W. Saleeby: Imperial Health and the Dysgenics of War. Followed by a discussion.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, April 25th, 1917.

Date.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Tem.	Wet Bulb.	Dry Bulb.	Remarks.
April 19	...	92	61	45	49	50	Overcast
,, 20	...	97	57	42	44	48	Fine
,, 21	...	73	53	47	48	50	Overcast
,, 22	...	81	52	38	44	49	Cloudy
,, 23	...	94	56	41	40	43	Cloudy
,, 24	...	91	60	36	39	42	Fine
,, 25	...	85	53	42	45	47	Overcast

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

The following journals, magazines, &c. have been received:—Albany Medical Annals, Revista Odontologica, Medical Review, Journal of the Royal Naval Medical Service, Public Health, Cleveland Medical Journal, Journal of Nervous and Mental Disease, American Journal of Orthopedic Surgery, British Journal of Dental Science, Surgery, Gynecology, and Obstetrics, Journal of Laryngology, Rhinology, and Otology, American Journal of Medical Sciences, Eugenics Review, American Journal of Roentgenology, American Journal of Public Health, Journal of Comparative Pathology and Therapeutics, Annales de l'Institut Pasteur, Tropical Diseases Bulletin, Canadian Journal of Medicine and Surgery, Midland Medical Journal, Calcutta Medical Journal, Medical Journal of South Africa, Bulletins et Mémoires de la Société Médicale des Hôpitaux, Proceedings of the Royal Society of Medicine, British Dental Journal, &c.

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Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

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A Report
ON
TWENTY-FIVE CASES OF TETANUS.

(To the Medical Research Committee.)

BY H. R. DEAN, M.D. OXON., F.R.C.P. LOND.,
MAJOR, R A.M.C. (T.).

(FROM THE 2ND WESTERN GENERAL HOSPITAL AND THE DEPARTMENT OF PATHOLOGY OF THE UNIVERSITY OF MANCHESTER.)

THE following notes are based for the most part on observations made on 25 cases of tetanus which have occurred during the last four months in the 2nd Western General Hospital. The majority of the men had been wounded in the battle of the Somme, and it is probable that almost all, if not all, had received prophylactic injections in France.

In all the cases the wounds had been at one time or another septic, but in 9 cases they had healed, or practically healed, at the time of onset of tetanus. In 13 cases the wounds had been of a severe nature, including considerable laceration of tissue. In four cases they were quite superficial. In one case tetanus followed 14 days after the re-amputation of what appeared to be a perfectly clean stump. That is to say, in at least 5 of the 25 cases the wounds were of such a nature that it is improbable that the most conscientious medical officer would have selected these men for further prophylactic injections. That the risk of tetanus is greater in the larger and more septic wounds is, no doubt, true as a general rule; nevertheless it can hardly be doubted that the administration of a prophylactic injection to every wounded soldier after his arrival in England, no matter how trivial his wound might appear, would be followed by a very substantial reduction in the number of cases of tetanus.

Of greater value as an indication for the administration of prophylactic injections than the mere extent of the wound or the amount of the discharge is the presence of a foreign body or the existence of a compound fracture. In either case there is likely to be dead tissue providing a focus for the multiplication of the tetanus bacillus, which is essentially a saprophyte with little or no capacity for growth in living tissue. A compound fracture was present in 11 of the 25 cases, in 2 a leg had been amputated, in 7 cases there was a history of removal of a bullet or fragment of shell, in at least 2 cases a foreign body was still in the tissues of the patient at the time of the onset of tetanus.

It was considered probable that tetanus would frequently occur in those cases in which the interval of time between the injury and surgical treatment at a casualty dressing station was considerable. The result of inquiries made on this point of the 25 patients is one of the points recorded in Table I. Comparatively few of the men remained untreated for any great length of time.

SIGNS AND SYMPTOMS.

It is well established that the course of tetanus is profoundly modified by prophylactic injection. The length of the incubation period in the 25 cases is recorded in Table I. In 10 cases the incubation period from the original date of the wound exceeded 50 days. The date of any operation was ascertained as far as it was possible by questioning the patient. In two cases only did signs of tetanus develop within 10 days of the date of an operation.

One result of the prolongation of the incubation period is that tetanus is likely to develop in patients whose wounds have healed and who have been transferred to hospitals for convalescents. These patients are naturally not under such constant medical supervision as are those whose wounds require attention several times during the day. The earliest signs of tetanus may in such cases be readily overlooked, and indeed are commonly not reported by the patient until they have persisted for some days. In several of these cases the disease was not recognised until symptoms had persisted for many days. The history of these cases shows the slow rate of progress of symptoms which is characteristic of many cases of tetanus occurring in persons who have received prophylactic inoculation. Not only do the prophylactic injections lengthen the incubation period, but they prolong, in many cases, the rate of onset and development of symptoms over a period of days and even weeks. This is a great advantage, as successful treatment is still possible after definite signs of tetanus have existed for several days. Nevertheless, the insidious character of the onset, and the apparently trivial nature of the early symptoms, may offer considerable difficulty in early diagnosis.

TABLE I.

No. of case.	Hours after wound before treatment at dressing-station.	No. of days before onset of tetanus: After wound.	No. of days before onset of tetanus: After operation.	Compound fracture (C. f.) or foreign bodies (F.b.) in wound.	Muscles involved.
1	½ hour.	54	—	Nil.	Rt. leg, jaws, and neck.
2	½ ,,	14	14	Shrapnel and trouser button.	Rt. arm, jaw, and neck.
3	14 hours.	18	18	Bullet; C. f.	Jaw and neck.
4	½ hour.	87	70	Fragment of loose bone.	Jaw, back, legs, and neck.
5	½ ,,	68	60	Fragments of bone.	Jaw and leg.
6	6 hours	127	31	Nil.	Jaw, neck, back, abdomen, and legs.
7	5 ,,	22	—	,,	Lt. leg, back, and abdomen.
8	½ hour.	9	—	,,	Jaw, neck, and back.
9	½ ,,	74	26	Septic stump.	Jaw, neck, back, and abdomen.
10	½ ,,	82	80	C. f. lt. radius and femur.	Jaw, neck, lt. arm, face, and abdomen.
11	5 hours.	12	10	Shrapnel.	Neck, jaw, back, abdomen, and legs.
12	12 ,,	64	—	C. f.	Jaw, neck, and lt. arm.
13	½ hour.	62	—	N.I.	Jaw, lt. hip, and abdomen.
14	½ ,,	12	10	Shrapnel.	Lt. biceps and vastus externus.
15	10 hours.	27	14	Amputation.	Jaw.
16	7 ,,	45	—	F. b. not yet removed.	Jaw, neck, and lt. leg.
17	½ hour.	13	11	Fragments of shell.	Neck, face, abdomen, and back.
18	26 hours	17	15	C. f. tibia and fibula.	Jaw, neck, back, abdomen, legs.
19	½ hour.	68	—	Nil.	Rt. ham-strings, jaw, and neck.
20	28 hours.	91	—	C. f. shrapnel.	Jaw, neck, abdomen, and rt. leg.
21	1 hour.	10	8	Shrapnel.	Back, abdomen, and rt. leg.
22	26 hours.	18	17	C. f. olecranon; fragment of bone removed.	Jaw, neck, and forearm.
23	25 ,,	102	100	C. f. tibia and fibula.	Jaw, lower spine, abdomen, lt. thigh, and calf.
24	½ hour.	50	5	C. f.; shrapnel.	Jaw, neck, l. leg, back, and abdomen.
25	1 ,,	59	—	C. f.; F. b.	Jaw, neck, back, abdomen, and lt. leg.

The earliest signs are often localised to the immediate neighbourhood of the infected wounds, and it is possible that this localisation is a result of the prophylactic inoculation. Nevertheless, in 11 cases stiffness of the jaw and neck was the earliest recorded symptom.

The muscles in the immediate vicinity of the wound may twitch or show irregular clonic contractions. A slight tap increases the violence of such contractions, and may cause a spread to adjacent groups of muscles. In other cases the earliest observed sign has been a tonic contraction of a group of muscles, usually a flexor group, near the wound. These patients complained of stiffness and pain in one or more limbs, and in some cases a diagnosis of rheumatism or muscular rheumatism was made. It is perhaps worthy of note that 6 of the 25 patients were treated with sodium salicylate or aspirin during the period of onset. The condition may remain strictly localised for days and even weeks. There is usually a gradual spread to adjacent groups of muscles, but in some cases, even in the absence of serum treatment, there appears to have been but little change in the symptoms from day to day.

Sooner or later, however, in the majority of cases the signs become generalised—that is to say, other groups of muscles far removed from the site of the wound become involved.

The muscles most frequently involved appear to be the masseters, the posterior cervical muscles, the muscles of the anterior abdominal wall, the spinal muscles in the dorsal and lumbar region, the flexors of the hip-, knee-, and ankle-joints. In 3 cases there was spasm of the facial muscles. With the exception of those cases in which there was a wound of hand or arm the muscles of the upper extremity escaped. The groups of muscles involved in each of the 25 cases are shown in the table. It will be seen that the masseters were affected in 21 cases. The degree of spasm varied considerably. In no case were the jaws absolutely closed, and in a few cases there was only a little stiffness of the masseters. Stiffness of the posterior cervical muscles is an early sign of generalisation, and from the muscles of the neck the spasm usually spreads downwards to involve the muscles of the dorsal region. Extreme rigidity of the abdominal muscles is often a marked feature.

The reflexes of the lower limbs are commonly exaggerated. The knee-jerk is violent and may be followed by tremors or clonic contractions of the quadriceps extensor. There is an exaggerated response to plantar stimulation, involving as a rule all the muscles of the leg and thigh, and in some cases producing spasm of the lumbar muscles. Occasionally there is, in addition, a crossed response with spasmodic contractions of the muscles of the other leg. Ankle clonus can sometimes be obtained. It would be anticipated that the knee-jerk would not be obtained in cases in which there was spasm of the hamstring group. In some cases this anticipation was fulfilled, in others stimulation of the patellar tendon produced a sharp contraction of the quadriceps extensor, followed almost immediately by a violent spasm of the hamstrings. The effect produced was that of a double jerk. With the exception of those cases in which tetanus originated in the muscles of the upper limb, the triceps jerks were increased in two cases only.

In severe and advanced cases the posture was often characteristic. The patient usually preferred to have his shoulders supported by pillows. The back was somewhat arched, the head retracted, the shoulders were thrown back, and the weight of the body was partly supported on the back of the upper arms and elbows. In more advanced cases definite opisthotonos was observed.

Other signs which accompanied generalisation of the spasms were profuse perspiration and a quickening of the pulse-rate. Many of the patients were convalescents and the temperature was normal at the time of onset of symptoms, and remained at normal or a little above normal throughout the attack of tetanus. In these cases the association of a pulse of 100 to 130 with a normal temperature (11 of the 25 cases) was rather striking. Within about 48 hours of the intravenous injection of an adequate dose of antiserum the pulse-rate begins to fall rapidly, although no amelioration of the spasm may be apparent until several days later. Under these conditions the fall of the pulse-rate is probably the earliest indication of successful serum treatment.

Generally speaking, the 25 cases may be classified in three groups.

1. Four cases in which the spasm remained localised to the muscles in the neighbourhood of the wound.

2. Ten cases in which the spasms commenced in the neighbourhood of the wound and remained for a time localised. After a variable interval generalisation occurred.

3. Eleven cases in which there was no history of preliminary local spasms, and the disease commenced suddenly by involvement of the jaw and neck muscles.

MILD CASES TREATED ENTIRELY BY INTRAMUSCULAR INJECTIONS.

In 5 cases serum treatment was confined to intramuscular injections. All were of a mild type and all made uneventful recoveries. Three cases (Nos. 14, 21, and 22) had received prophylactic injections after admission to the 2nd Western General Hospital, and the duration of the disease was very short. In very mild cases intramuscular injections are quite sufficient, and they have the great advantage of being devoid of risk. A dose of 10,000 units, followed at three-day intervals by a second and third dose, each of 5000 units, is probably quite enough for cases in which the signs are localised to the vicinity of the wound.

CASE 14.—Wounded on Sept. 25th. On Oct. 24th there was an exceedingly septic wound of knee-joint. On Oct. 29th a prophylactic injection of 1000 units was given. On Nov. 6th twitching of biceps and vastus externus was observed. An intramuscular injection of 5000 units was given. The signs were localised to the hamstring muscles, and were more marked on the left side. The contractions were irregular and fibrillary. Plantar reflexes exaggerated; knee-jerks normal. The spasmodic contractions ceased within a few days.

CASE 21.—Wounded on Nov. 21st (by shrapnel) in lumbar region, right thigh, and right upper arm. The wounds were suppurating on admission to 2nd Western General Hospital. A prophylactic injection of 500 units was given on Nov. 26th. Complained of severe pain in back on Dec. 7th and 8th. On Dec. 13th tonic spasm of lumbar and abdominal muscles. An intramuscular injection of 3000 units was given. On Dec. 14th rigidity of lumbar muscles with occasional painful spasms. Knee-jerks and plantar reflex exaggerated on right side and ankle clonus. Plantar reflex exaggerated on left side but not knee-jerk. 4500 units were injected on Dec. 14th, 3000 on Dec. 22nd, and 1500 on Dec. 30th. On Dec. 28th a piece of shell was removed. Spasms ceased after this date.

CASE 22.—Wounded on Nov. 29th. On Dec. 8th there was an exceedingly septic wound of left elbow with compound fracture of olecranon. On Dec. 9th a prophylactic injection of 1500 units was given. On Dec. 16th spasm of masseters, stiffness of neck muscles, and slight tremor of muscles of forearm were observed. An intramuscular injection of 3000 units was given, and the signs had completely disappeared within a week.

CASE 5.—Wounded on August 8th and left foot amputated close above ankle on following day. Arrived in Manchester on Sept. 17th with septic stump on left side and septic wound of right heel, with compound fracture of os calcis. On Oct. 15th patient complained of stiffness of jaw, which he had first noticed three days earlier. On Oct. 16th there was definite spasm of masseters; knee-jerks exaggerated. No sweating. P. 72; T. normal. An intramuscular injection of 10,500 units was given. On Oct. 18th there were pain and stiffness of thighs and back. On Oct. 20th improvement began; recovery rapid and uneventful.

CASE 16.—Wounded on Oct. 8th. Wounds of left axilla, left thigh, leg, and foot. On Nov. 18th a foreign body was detected by X rays near tibia on interosseous membrane. On Nov. 10th left big toe began to twitch. During next week twitching was noticed in muscles of leg. On Nov. 18th complained of stiff jaw. On Nov. 22nd definite spasm of jaw and neck muscles. Knee jerks exaggerated and followed by clonic contractions of quadriceps extensor. Plantar reflexes exaggerated. Fibrillary contractions of gastrocnemius and hamstrings on left side. 5000 units were injected on Nov. 22nd and again on Nov. 25th. Recovery uneventful.

CASES IN WHICH AN INTRATHECAL INJECTION WAS GIVEN.

In six cases an intrathecal injection of serum was administered.

CASE 1.—Wounded on August 4th. There was a perforating wound on left upper arm, wound of right thigh, and superficial wounds below left knee. Was sent to convalescent hospital on August 16th. He was up and out every day until Sept. 17th, when he noticed stiffness of right leg which steadily increased during next ten days. On Sept. 27th remained in bed and complained of stiffness of jaw and neck and pain in small of back. Cramps in right leg began the same evening. At 8.30 P.M. he was sweating profusely; T. 99°, P. 104. All wounds had completely healed. Jaw and neck muscles tense, right thigh, knee and ankle flexed, tonic spasm of hamstrings, unable to straighten leg. Painful spasms occurred every 10 minutes in hamstrings. On tapping right patellar tendon violent spasm of quadriceps extensor which was cut short and followed by violent contractions of hamstring group. Archilles jerk and plantar reflex exaggerated. Reflexes of left leg exaggerated but not to same extent. Triceps and supinator jerks increased on both sides. Percussion note was dull over lower lobe of lung on both sides; numerous crepitations heard. An intrathecal of 5000 units and intramuscular injection of 10,000 units were given. On Sept. 28th intrathecal injection of 5000 units. Patient died on evening of Sept. 29th; immediate cause of death pneumonia.

CASE 2.—A report[1] of this case is published separately by Mr. J. Gow. There was very intense spasm of flexors of right wrist and metacarpus, accompanied by stiffness of muscles of neck and jaw. Three intrathecal injections were given. Owing to the fact that the most intense symptoms suggested an involvement of the cervical enlargement, two of these injections were given by inserting a needle between the first and second dorsal vertebræ. The intrathecal were supplemented by numerous intramuscular injections. Patient made a good recovery; after which a metal trouser button made its way out from between thumb and index finger of right hand. The chief seat of spasm had been the flexor muscles of right wrist and metacarpus.

CASE 6.—Wounded on June 2nd. On arrival in Manchester there were numerous small, superficial, suppurating wounds of buttock and right thigh. All these healed except small sinus in perineum, which was opened up on July 25th and on Sept. 16th. On Oct. 17th patient is said to have choked and had what was described as a fit. Stiffness of neck and jaw was observed. On Oct. 18th he was sitting propped up in bed; T. 97·8°, P. 110. Perspiration profuse. Spasm of muscles of jaw, neck, back, and abdomen. Knees slightly flexed and increased tone of hamstring muscles. Knee-jerks and plantar reflexes exaggerated. An intravenous injection of 30,000 units was given. On Oct. 20th intrathecal injection of 10,000 units at 10 P.M. At 2 A.M. on Oct. 21st a series of violent convulsions occurred with violent spasmodic movements of the limbs. Patient became completely unconscious and remained so until the evening. The convulsions, controlled to some extent by chloroform, continued throughout the day. T., normal before intrathecal injection, rose to 102·4°. Patient's condition remained very critical for 24 hours. On Oct. 22nd he was rather better. Signs of septic bronchopneumonia developed on Oct. 26th and he died on Nov. 28th. The convulsions which followed the intrathecal injection were probably of cerebral origin and were almost certainly the result of the injection. The pneumonia was probably the result of inhalation of septic particles during the period of unconsciousness.

CASE 7.—Wounded on Sept. 26th. On arrival in Manchester on Oct 4th had large open granulating wound of left thigh. On Oct. 18th and 19th clonic spasms of left quadriceps extensor were observed with slight stiffness of left hip and back. On Oct. 20th he was sitting up in bed with left hip fixed and knee extended. Tonic spasm of quadriceps extensor. Occasionally spasms spread to lumbar muscles. Slight perspiration; T. 98·8°, P. 80. Jaw muscles normal and reflexes not increased. An intrathecal injection of 5000 units was given. During Oct. 21st violent spasms of quadriceps every 20 seconds were observed. Subcutaneous injection of 1000 units. On Oct. 22nd spasms were less frequent; intrathecal dose of 4500 units. On Oct. 23rd spasms less violent. At 7.30 P.M. on Oct. 24th a sudden spasm or convulsion occurred in which chin was drawn down on to sternum. There had

[1] The report of the case appears on p. 689 of this issue.

been at no time any tonic spasm of jaw or neck muscles. Patient became delirious and shortly afterwards comatose. He died in state of deep coma with stertorous breathing about 8 P.M. At autopsy extreme venous congestion of viscera found; heart dilated and filled with blood; lumbar cord coated with pus.

CASE 8.—Wounded on Oct. 7th. On Oct. 13th he had numerous small superficial and rather dirty wounds at back of right calf, a superficial wound on outer aspect of right thigh, and superficial wounds of buttock. Tetanus began with stiffness of jaw and neck on Oct. 16th and 1500 units were injected beneath skin. On Oct. 17th intrathecal injection of 5000 units. On Oct. 20th tonic contraction of muscles of jaw, neck, and back. Intramuscular injections of 10,000 units on Oct. 20th, 4500 units on Oct. 26th, and 6000 units on Oct. 28th. Patient made uneventful recovery.

CASE 19.—Wounded on Oct. 2nd. There were multiple wounds of right thigh, all of which had completely healed at time of onset of tetanus. On Dec. 6th patient noticed pain in right leg, but did not complain until Dec. 9th. On Dec. 10th intrathecal injection of 1000 units was given. Before injection T. 98° and P. 86, after injection T. 102° and P. 88. He complained of violent headache and severe pain in back. He was restless; twitching of muscles of face and leg observed. On Dec. 11th tonic contraction of hamstrings and gastrocnemius on right side. Knee and hip flexed and foot arched. Knee-jerk could just be obtained; it was very exaggerated on left side. Muscles of neck, but not of jaw, were stiff. The following intramuscular injections were given: Dec. 11th, 10,000 units; Dec 15th, 5000 units; Dec. 19th, 5000 units; and Dec. 24th, 3000 units. Improvement was very slow and spasm of hamstring has not yet entirely disappeared.

THE INTRAVENOUS METHOD.

Fourteen cases were treated on the day of notification by the intravenous injection of serum under chloroform anæsthesia. The condition of the patient was serious at the time of injection in all these cases, and the signs of tetanus were well marked. In 13 there was well-marked stiffness of jaw, in 1 slight but definite spasm of the masseters. In 10 cases there was spasm of muscles of neck, in 9 of muscles of back, in 7 of abdominal muscles. Opisthotonos was present in 6. In 12 the knee-jerks and plantar reflexes were exaggerated. That is to say, in all the 14 cases the signs were well advanced, and had ceased to be limited to the muscles of the locality of the wound. One patient died and 13 recovered.

The serum was given in one dose, 30,000 U.S.A. units, and the volume of the injection varied from 120 to 190 c.c. Injections were given with a 20 c.c. "Record" syringe fitted with the two-way tap and tube recommended by Graham for the intravenous injection of eusol. The method employed was as follows:—

A glass pint measure being sterilised, into it were emptied 22 small serum flasks, each of which contained 1500 units. Some of the serum was inevitably wasted, which was compensated by the two extra flasks of serum. The measure was placed in a basin of warm water. The patient was anæsthetised with chloroform and a thin rubber bandage was used to constrict slightly the upper arm and render the veins prominent. The skin in front of the elbow was sterilised, usually with iodine. The end of the rubber tube was held in the serum by an assistant and the syringe was filled and emptied several times to get rid of air bubbles. The syringe was then half filled with serum and the needle inserted into the most prominent vein. The piston was then slightly withdrawn until blood appeared in the syringe and it was certain that the needle was in the lumen of the vein. The serum was then injected.

One patient died while still under the influence of the anæsthetic, but there was no reason to think that death was due to anaphylaxis. An abstract of this case will be found below. Of the remaining 13 patients one showed signs of collapse on recovering from the anæsthetic and was a source of some anxiety for about 24 hours. In the other 12 cases the condition of the patient after the injection was perfectly satisfactory. In 5 cases an urticarial eruption was noticed within a few moments of the injection, in 2 œdema of the eyelids.

Cases Treated by a Single Intravenous Injection of 30,000 Units of Antitoxin.

In 4 of these cases the entire serum treatment consisted of a single intravenous injection of 30,000 units. In the remaining 10 cases intramuscular and subcutaneous injections were also given, but the amount so given was, in the majority of the cases, comparatively small. (Table II.)

CASE 3.—Wounded on Sept. 15th. At time of onset septic wound of left orbit and septic wound of right shoulder. Jaw had been stiff on Oct. 1st and 2nd, but the patient had not complained. On Oct. 3rd, T. 103·6°, P. 114; profuse perspiration, incontinence of urine, marked trismus, neck muscles stiff, abdominal muscles normal, knee-jerks and plantar reflexes increased. Was given intramuscular injection of 9000 units and intravenous injection of 37,500 units. On Oct. 4th intramuscular injection of 6500 units. Steady improvement from Oct. 7th. All signs had disappeared by Nov. 16th. This patient was under the care of Captain B. D. Telford, to whom I am indebted for permission to publish the case.

CASE 4.—Wounded on July 18th. On July 31st very septic wound of inner and front aspect of left forearm, compound fracture of ulna. August 4th: Fragment of bone removed. Sept. 22nd: Wound almost completely healed. Oct. 6th: Pains in limbs treated with sod. salicylate. Oct. 13th: Muscles of neck stiff, difficulty in opening mouth; was given subcutaneous injection of 1500 units. Oct. 14th: T. 99°, P. 120. Profuse perspiration; unable to open mouth, muscles of neck and upper dorsal region very stiff with frequent spasms. Knee-jerks, right triceps jerk, abdominal and plantar reflexes exaggerated. Wound closed except for very small area covered by granulation tissue. Intravenous injection of 30,000 units. Half an hour after injection profuse urticaria. No change for next four days. Oct. 19th: Profuse urticaria, pains in head, dazed and confused, conjunctivæ injected, for a period of 1½ hours violent spasms of back muscles occurring every 15 minutes, subsequently less frequent. Oct. 20th: Great improvement, no spasms. Subsequently uninterrupted recovery. No serum given except the intravenous injection of 30,000 units.

CASE 9.—Wounded on August 8th. Circular amputation middle of right thigh. Re-amputation Sept. 9th. Secondary hæmorrhage on numerous occasions. Wound very septic until Sept. 22nd, after which date marked improvement. Oct. 18th: Jaw slightly stiff. On morning of Oct. 20th twitching of back muscles observed and subcutaneous injection of 4500 units given. At 6 P.M. T. 101°, P. 140. Sweating slightly, jaws stiff but could open mouth a little. Neck and abdominal muscles rigid, left knee-jerk increased and followed by spasm. Exaggerated plantar reflex. Intravenous injection of 30,000 units. No great change until Oct. 25th, when 10 c.c. of cerebro-spinal fluid were withdrawn by lumbar puncture and an intramuscular injection of 5000 units was given. Oct. 26th: Considerable improvement. Oct. 27th: Intramuscular injection of 4500 units. Subsequently steady improvement. All signs had disappeared by Nov. 8th, on which day 1000 units were injected into muscles. Serum rash observed Oct. 23rd.

CASE 10.—Wounded on July 30th. Shell wounds left thigh and left forearm, compound fracture left radius and left femur. Wounds were very septic but great improvement had taken place, and wound of arm had completely healed. On night of Oct. 20th signs of tetanus developed very suddenly. On Oct. 21st sweating freely and in great pain. Spasm of facial and jaw muscles. Neck and abdominal muscles rigid. Knee-jerk exaggerated and followed by tremor. Plantar reflex exaggerated. Intravenous injection of 30,000 units. During next 24 hours generalised spasms were frequent. Oct. 23rd and 24th, slight improvement. Oct. 25th, 10 c.c. of cerebro-spinal fluid were removed by lumbar puncture and 5000 units injected into muscles. Oct 27th, cerebro-spinal fluid was again withdrawn by lumbar puncture and an intramuscular injection of 4500 units given. Improvement followed lumbar puncture on both occasions. After Oct. 28th improvement slow but continuous; all signs had disappeared by Nov. 24th. Injections of 1000 units given on Nov. 4th, 6th, 8th, 13th, and 16th. Serum rash observed on Oct. 24th.

CASE 11.—Wounded on Oct. 7th. Patient noticed "twitching" of left leg on Oct. 19th. This was worse on Oct. 20th, but he made no complaint until Oct. 22nd. On Oct. 21st jaw had felt stiff. On Oct. 23rd T. 97°, P. 130. Profuse perspiration, paresis of left side of face, tonic contraction of masseters, could just protrude tip of tongue, neck muscles stiff, abdominal muscles rigid. Left hip, knee, and ankle flexed; tonic spasms of hamstrings and calf muscles of left leg. Occasional spasms spread up to lumbar and lower dorsal muscles causing slight arching of back and lifting buttock from bed. Plantar reflexes and right knee-jerk exaggerated. Intravenous injection of 30,000 units under chloroform anæsthesia. Subsequent intramuscular injections of 4500 units on Oct. 31st, 2000 units on Nov. 13th, and 4000 units on Nov. 22nd. Made a good and uneventful recovery. No signs of tetanus after middle of November.

CASE 12.—Wounded on August 18th. Complained of pains in back and chest on Oct. 20th. Was treated with aspirin, but pain continued on Oct. 21st and 22nd. Complained of sore throat and stiffness of neck and back on Oct. 23rd, and a subcutaneous injection of 1,500 units was given on Oct. 23rd and 24th. On Oct. 25th patient was in great pain and sweating profusely. T. 98·8°, P. 112. Slight stiffness of jaw muscles, but could open mouth pretty well. Tonic spasm of neck and upper dorsal muscles. Knee-jerks, plantar reflexes, and right triceps jerk exaggerated. The left elbow was fixed as the result of injury. Intravenous injection 30,000 units under chloroform anæsthesia. Rapid recovery; all signs had disappeared by Nov. 15th. On Oct. 30th subcutaneous injection of 1500 units.

CASE 13.—Wounded on August 18th. Complained of backache on Oct. 19th; was treated with aspirin, which relieved the pain. On Oct. 23rd, complained of pain in back and difficulty in opening mouth. On Oct. 25th definite spasm of muscles of jaw; intramuscular injection of 1000 units. After this spasm of jaw and pain in back became more marked, and on Oct. 29th 1500 units were injected into the muscles. On Oct. 30th two generalised spasms involving muscles of limbs and trunk and accompanied by cyanosis, feeble pulse, and profuse perspiration. On Oct. 31st patient was sitting propped up in bed, head thrown back and back somewhat arched. Tonic spasm of neck and back muscles. Masseters tense, but could open mouth a little. Abdominal muscles rigid. Left hip forcibly flexed; tonic contraction of left hamstrings; knee half flexed; tonic spasm of calf muscles. Exaggerated plantar reflex. On tapping patellar tendon violent spasm of quadriceps extensor was produced, but the resulting knee-jerk was cut short by powerful spasm of hamstrings. On right side both knee-jerk and plantar reflex exaggerated. Intravenous injection of 30,000 units under chloroform anæsthesia. No more doses of serum were given. Uneventful recovery; all signs of tetanus had disappeared by Nov. 20th.

This case had several features of interest. There was a long incubation period (62 days). The symptoms came on slowly and insidiously, and the diagnosis remained in doubt for a long period. The symptoms gradually became more definite, and the condition was ultimately typical of tetanus of a severe type. A single large dose of antitoxin injected into a vein resulted in a satisfactory cure.

CASE 15.—Wounded on Oct. 12th. A circular amputation was performed on Oct. 14th, and on Oct. 21st patient was admitted to 2nd Western General Hospital with what appeared to be a perfectly clean surface to the stump. A Farabeuf's operation was performed on Oct 25th. Slight stiffness of jaw was noted on Nov. 8th, and was worse

on Nov. 9th. On Nov. 10th patient was sweating profusely. T. 100°, P. 120. Tonic spasm of masseters, patient being just able to protrude tip of tongue. No other group of muscles was involved. Knee-jerks and plantar reflexes normal. 30,000 units were injected into an arm vein under chloroform anæsthesia. This was the only dose of serum given. Rapid and uneventful recovery; all signs had disappeared by Nov. 25th.

CASE 17.—Wounded on Nov. 13 h. Wound of right thigh and right upper arm and shoulder, and of right side of chest. Admitted to 2nd Western General Hospital on Nov. 20th, when all wounds had closed except small wound in arm. Nov. 25th patient began to spit up blood. On examination percussion note over right lower lobe of lung was found to be dull and breath sounds absent. Œ dema of chest wall was observed. Nov. 26th, complained at 6 P.M. of difficulty in swallowing and opening mouth. At 10 P.M. he appeared to have a generalised spasm and bit his tongue. He was sweating profusely and had difficulty in opening mouth. Intramuscular injection of 3500 units was given. During night he became rapidly worse and several violent spasms occurred during which respiratory movements ceased and he became very cyanosed. At noon on Nov. 27th he was sitting propped up in bed with his head retracted. The movements were stiff and the muscles of neck and upper dorsal region were rigid. Knee-jerks and plantar reflexes normal. Any movement or effort caused violent spasm involving muscles of spine, neck, and to a less extent facial muscles. About 12.15 he had a violent and prolonged spasm during which respiratory movements ceased and he became very cyanosed. After prolonged artificial respiration breathing was re-established. His condition was then very serious, as the prolonged spasm had added greatly to the difficulties of a heart already embarrassed by the conditions present in the right pleural cavity. The signs of tetanus had, however, progressed so rapidly that it was felt that intravenous injection of a large dose of serum offered the only prospect of cure. The patient was anæsthetised and the cyanosis and respiratory difficulty increased. Venesection was performed, but the flow of blood was poor. An intravenous injection of 30,000 units was given. A few minutes later the cyanosis increased and respiratory movements ceased and the patient died. Death was due to heart failure, the result of the wound of lung, and the tetanic spasms involving the respiratory muscles. There was no reason to attribute death to anaphylaxis.

CASE 18.—Wounded on Nov. 13th. On morning of Dec. 2nd unable to open mouth. Slept well on following night. On Dec. 4th spasms of muscles of face, neck, and upper dorsal spine commenced at 7 A.M. An intramuscular injection of 6000 units was given. The condition at 6 P.M. was as follows: T. 98°, P. 120. Masseters, muscles of back and neck, dorsal and abdominal muscles rigid. Right knee-jerk exaggerated and followed by clonus of quadriceps extensor, exaggerated plantar reflex, ankle clonus. Triceps jerk somewhat exaggerated on both sides. Spasms every few minutes producing arching of back. At 7 P.M. under chloroform anæsthesia 30,000 units (140 c.c.) were injected into a vein. As the patient recovered from the anæsthetic œdema of eyelids was noticed and a profuse urticarial rash appeared over face and hands and upper part of chest. The pulse became rapid and was of poor volume. The face was pale and the respirations shallow. A hypodermic injection of ether was given. Signs of shock had practically disappeared the next day. For the next few days there was little change except that spasms gradually became less frequent. On Dec. 9th definite improvement commenced, and signs of tetanus had almost disappeared by Dec. 19th.

CASE 20.—Wounded on Sept. 3rd. Seven weeks later a piece of shrapnel was removed. Was sent to convalescent hospital on Nov. 3rd. Here he was out every day until Dec. 3rd, when he complained of cramp in his leg. On Dec. 4th he was treated with aspirin. The pain, however, got gradually worse, and after Dec. 8th he remained in bed. On Dec. 9th he had difficulty in swallowing and complained of stiffness of jaw; T. 98·8°, P. 116. 2000 units were injected into the muscles. On Dec. 10th spasms of muscles of back had commenced. Intramuscular injections of 2000 units were given on the 10th, 11th, 12th, and 13th. On Dec. 13th the condition was as follows: T. 98·4°, profuse perspiration, sitting propped up in bed, jaw very stiff but could open mouth a little. Muscles of neck, spine, and abdomen rigid. Every few minutes spasm of spinal muscles producing arching of back. Right hip and knee flexed and foot arched. Tonic spasm right hamstrings and gastrocnemius. Right knee-jerk could not be obtained. Left knee-jerk exaggerated and followed by tremor of quadriceps extensor. Left plantar reflex exaggerated. Intravenous injection of 30,000 units (185 c.c.) under chloroform anæsthesia. Colour and respiratory movement remained good throughout, and after the injection. At the end of injection pulse quickened to 116; temperature 98°. There was no sign of shock. Immediately after the injection a profuse urticarial rash appeared which was most marked on hands, face, and neck. There was well-marked œdema of eyelids. The rash faded in about 10 minutes, and the œdema of eyelids subsided shortly afterwards. It will be observed that this patient had had intramuscular injections of serum on Dec. 9th, 10th, 11th, 12th, and 13th, and if such injections are capable of effecting so-called desensitisation it is remarkable that the urticaria and œdema of eyelids should have been observed. No further injections of serum were given. Patient began to show marked improvement after Dec. 16th, and signs of tetanus had disappeared by Dec. 21st.

CASE 23.—Wounded on Sept. 3rd. Compound comminuted fracture of left tibia and fibula. On Dec. 14th patient complained that his toes were gripping the end of the splint. On Dec. 16th he complained of increased pain in leg and was treated with aspirin; morning T. 97°, P. 104, evening T. 97·2°, P. 122. Dec. 17th, T. 97°, P. 114. Condition on Dec. 18th was as follows: Sweating profusely, P. 120. Tonic spasm of calf muscles on left side, toes sharply flexed on splint. Abdominal muscles hard, very slight spasm of masseters. Right knee-jerk exaggerated and followed by clonic contraction of quadriceps extensor. Plantar reflex exaggerated. Every five minutes spasm of muscles of thigh. These spasms occasionally spread to lumbar and lower spinal muscles, lifting the buttock from the bed. Intravenous injection of 30,000 units (150 c.c.) under chloroform anæsthesia. Uneventful recovery.

CASE 24.—Wounded on Oct. 20th. Foreign body removed from leg on Dec. 4th (500 units had been injected on Dec. 3rd). Complained of sore-throat on Jan. 7th. Inflammation of fauces, swelling of neck, and enlargement of lymphatic glands observed. On Jan. 9th complained that neck was stiff. Jan 10th, neck very stiff, jaw slightly stiff. Condition on Jan. 11th: T. 98°, P. 106, sweating, complained of pain in neck. Masseters in tonic contraction but could open mouth a little. Neck, upper dorsal and abdominal muscles rigid. Plantar reflexes exaggerated, knee jerks normal. At intervals of few minutes spasms of spinal muscles during which back was arched and body rested on back of head, buttock, and elbows. An intravenous injection of 30,000 units was given under chloroform anæsthesia. The patient began to improve on Jan. 15th, and had quite recovered by the first week in February. No further dose of serum was given.

CASE 25.—Wounded on Nov. 5th. Was up and going out daily during December. Patient noticed that his jaw was stiff on Jan. 3rd, but made no complaint. The jaw remained about the same until Jan. 10th, when he complained of severe pain in the shoulders. He was treated with sodium salicylate. On Jan. 11th a few spasms of neck and back occurred. During next night spasms became frequent and very painful. Condition on Jan. 12th: T. 97°, P. 88. Sweating profusely and in great pain. Tonic spasm of masseters, but just able to protrude tip of tongue. The patient was lying in bed with his head and shoulders propped up. The back was arched and weight of body rested on back of head, buttock, and backs of elbows. Abdominal muscles rigid. Left leg was extended and rather stiff; knee jerk and plantar reflexes increased. The right knee was still bandaged, a wound in this situation being still unclosed. All other wounds were healed. Every four minutes painful generalised spasms occurred, arching of back was accentuated, and buttocks and thighs lifted from bed. An intravenous injection of 35,000 units was given under chloroform anæsthesia. A few minutes later an urticarial rash appeared. Next day there was little change in the general condition, but the spasms were rather less frequent. Definite and rapid improvement commenced about one week after the injection. No further injections were given, and all signs of tetanus had disappeared by Jan. 28th. A swelling appeared in the neighbourhood of the wound of knee about Jan. 20th, and it seemed probable that there was a sequestrum in this situation. An X ray examination revealed the presence of several foreign bodies.

TABLE II.

No. of case.	Interval between last serum injection and intravenous injection.	Serum given in treatment before or after intravenous injection of 30,000 units.		Signs of anaphylaxis.
		Before.	After.	
3	7 hours.	9,000 (M)	6,500 (M)	0
4	24 ,,	1,500 (S)	0	Urticaria.
9	6 ,,	4,500 (M)	10,500 (M)	0
10	83 days.	0	12,500 (M)	0
11	8 hours.	4,500 (M)	10,500 (M)	0
12	24 ,,	3,000 (S)	1,500 (S)	0
13	48 ,,	2,500 (S)	0	Urticaria.
15	30 days.	0	0	0
18	6 hours.	6,000 (M)	5,000 (M)	Urticaria, œdema of eyelids, feeble pulse, shock.
20	9 ,,	10,000 (M)	0	Urticaria and œdema of eyelids.
23	98 days.	0	0	0
24	39 ,,	0	0	0
25	69 ,,	0	0	Urticaria.

The figures indicate units of antitoxin. M = Intramuscular; S = Subcutaneous.

Note.—In the case of the long intervals the number of days indicates the period between the prophylactic and the intravenous injection. The short intervals occurred in cases in which serum treatment had been commenced before the intravenous injection.

OBJECTS OF SERUM TREATMENT.

The symptoms of tetanus are in themselves evidence that the toxin has reached and has begun to act on the central nervous system. Even if a diagnosis is made at the earliest possible moment it is obvious that serious damage has already been done. Before discussing the merits of alternative methods it seems desirable to define the objects which it is hoped to effect by the therapeutic use of antitoxin. The possible results of serum treatment fall under two headings.

1. To neutralise and destroy all the free toxin which is circulating in the blood and tissues, and to maintain in the blood and lymph such a concentration of antitoxins as shall be sufficient to neutralise the subsequent output of toxin from the infected focus.

2. To endeavour to obtain such a concentration of antitoxin in the central nervous system as shall serve to dissociate the toxin which has already reached the nerve cells.

It is improbable that the second object can be attained, but since it is generally held that tetanus toxin reaches the central nervous system by way of the peripheral nerves it is no doubt desirable to maintain a sufficient supply of antitoxin in the tissues of the central nervous system, in order that the toxin may be neutralised as it arrives, and before it is able to damage the nerve cells.

The all-important object of serum treatment, and the object which can certainly be attained, is the neutralisation of toxin before it reaches the central nervous system, and consequently the method which should be used is that which permits us to saturate as rapidly as possible all the tissues of

the body with antitoxin. The method which fulfils these conditions is the intravenous method. Very large quantities of serum (200 c.c.) can be introduced into a vein, and are certainly and rapidly distributed throughout the body.

After subcutaneous and intramuscular injections the absorption of the serum is relatively slow, and valuable time is lost. Moreover, it is not convenient to inject a very large volume of serum beneath the skin or into the muscles, for the resulting swelling is not without pain to the patient. The more serious objection to these two methods is, however, the interval which must elapse before the antitoxin is absorbed. As regards the size of dose, it is obvious that the intrathecal method of injection is the least advantageous, for unless the serum contains a relatively large number of antitoxin units to the cubic centimetre the dose which can be given with safety is comparatively small. The advantage claimed for the intrathecal method is, that the antitoxin introduced by this route reaches most rapidly the essential seat of the mischief—the cells of the central nervous system.

The cerebro-spinal fluid is said to be secreted by the choroid plexus and is probably absorbed and carried away by the cranial sinuses and meningeal veins. Its chemical composition is chiefly remarkable for its low protein content, in which respect it differs markedly from lymph. The separate existence of lymphatic channels in the central nervous system has apparently not been proved or definitely disproved, and it is sometimes stated that the cerebro-spinal fluid plays to the central nervous system the part which is played by lymph to other organs of the body. But the lymph in other parts of the body acts as a middleman between the blood and the cells. If the central nervous system is devoid of true lymph, and if all the functions of lymph are discharged by the cerebro-spinal fluid, then the cells of the various regions of the brain and cord are entirely dependent on a fluid secreted by a comparatively small gland (the choroid plexus) and from a comparatively insignificant blood-supply. But all parts of the brain and cord are richly supplied with arteries and capillary vessels which form a basket-like plexus around the nerve cells of the grey matter, and it is probable that the capillaries of the central nervous system perform the same functions as capillaries in other parts of the body. It seems reasonable to assume that antitoxin can pass from the vessels to the tissues in the brain and cord as freely as in other organs.

It is said that antitoxin which is injected into the blood-stream does not reach the cells of the central nervous system because, after an intravenous or intramuscular injection of serum, it has not been found possible to demonstrate antitoxin in the cerebro-spinal fluid removed from the spinal theca. This argument is only valid if we assume that there is a system of channels which connect the subarachnoid space with the interior of the cord and brain. On the other hand, if no considerable anastomosis exists between the subarachnoid space and the pericellular spaces of the grey matter, and if antitoxin is able to pass from the cerebral and spinal capillaries to the nerve cells, it is matter of little importance whether it can or not pass to the fluid in the subarachnoid space.

THE AMOUNT OF ANTITOXIN IN THE CEREBRO-SPINAL FLUID AFTER THE INTRAVENOUS INJECTION OF ANTISERUM.

Cerebro-spinal fluid was obtained by lumbar puncture from five patients at various intervals after the intravenous injection of antiserum.

Observation 1.—The patient (Case 13) was given an intravenous injection of 30,000 units of antitoxin at 10 P.M. on Oct. 31st. Twelve hours later samples of blood serum and cerebro-spinal fluid were obtained. Guinea-pigs were injected as follows:—

No.	Weight in grammes.	Amount of toxin.	Amount of serum or cerebro-spinal fluid.
1	700	0·002 c.c.	1 c.c. } cerebro-spinal fluid.
2	710	0·01 ,,	1 ,, }
3	750	0·1 ,,	1 ,,
4	690	0·01 ,,	1 ,, }
5	680	0·1 ,,	1 ,, } serum.
6	760	1·0 ,,	1 ,, }
		Control Animals.	
8	690	0·001 c.c.	3 c.c. } normal serum.
9	850	0·001 ,,	2·5 ,, }
10	800	0·001 ,,	0 saline solution.

Unfortunately one of the controls, No. 10, which received 0·001 c.c. of toxin without any antitoxin, did not die. The animal developed signs of tetanus five days after inoculation, and developed generalised spasm on the seventh day. It was very ill but ultimately recovered. No. 9 developed signs of tetanus on the third day and died of tetanus on the seventh day. No 8 developed signs of tetanus on the fourth day and died of tetanus on the eighth day. It may be assumed that 0·001 c.c. was the smallest quantity of toxin capable of killing a guinea-pig of 700 to 800 grammes in weight. All the other animals, 1 to 6, remained perfectly well and never showed the slightest sign of tetanus. 1 c.c. of the patient's cerebro spinal fluid protected animals against twice, ten times, and 100 times the fatal dose. 1 c.c. of the patient's serum protected against 10, 100, and 1000 fatal doses.

It is evident that 12 hours after an intravenous injection of 30,000 units both the cerebro-spinal fluid and blood contained an ample quantity of the free antitoxin.

Observation 2.—Samples of blood and cerebro-spinal fluid were obtained from the patient (Case 23) 24 hours after an intravenous injection of 30,000 units. Animals were injected as follows:—

No.	Weight in grammes.	Amount of toxin.	Amount of cerebro-spinal fluid or blood serum.
1	650	0·1 c.c.	1 c.c. cerebro-spinal fluid.
2	620	0·01 ,,	1 ,, } blood serum.
3	600	0·1 ,,	1 ,, }
4	600	1·0 ,,	1 ,, }
		Controls.	
5	670	0·001 c.c.	1 c.c. normal saline solution.
6	650	0·002 ,,	
7	650	0·004 ,,	

No. 5 developed signs after 48 hours and generalised spasms on the fifth day. It ultimately died with well-marked signs of tetanus on the fifteenth day. No. 6 developed signs after two days and died of tetanus on the eighth day. No. 7 developed signs after 24 hours and died on the third day. The quantity of cerebro-spinal fluid obtained was only enough for one experiment. This animal (No. 1) died of tetanus on the third day. No 2 and No. 4 remained perfectly well and developed no signs of tetanus. No. 3 never developed any sign of tetanus, but succumbed to some intercurrent disease on the fifteenth day.

This experiment as regards the cerebro-spinal fluid was not conclusive. It evidently did not contain any very large amount of antitoxin. On the other hand, 1 c.c. of the patient's serum contained enough antitoxin to neutralise from 500 to 1000 times the fatal dose for an animal of 600 grammes weight.

Observation 3.—The cerebro-spinal fluid was obtained from the patient (Case 25) 19 hours after an intravenous dose of 35,000 units.

No.	Weight in grammes.	Amount of toxin.	Amount of cerebro-spinal fluid.
1	600	0·008 c.c.	5·0 c.c.
2	600	0·004 ,,	1·0 ,,
3	590	0·004 ,,	0·5 ,,
4	590	0·008 ,,	0·5 ,,
5	560	0·02 ,,	0·5 ,,
		Controls.	
6	630	0·003 c.c.	+ Saline solution.
7	630	0·004 ,,	
8	620	0·006 ,,	
9	620	0·008 ,,	

No. 8 died with generalised spasm within 48 hours. No. 6, No. 7, and No. 9 developed signs on the second day, No. 7 and No. 9 died on the fourth day and No. 6 on the seventh day. Of the animals which had received the patient's cerebro-spinal fluid No. 5 died with generalised spasms within 48 hours. No. 4 developed signs on the second day and died on the fourth day. No. 3 developed stiffness in the limb nearest the site of inoculation. The spasm remained localised, and the animal, which was never seriously ill, recovered. No. 1 and No. 2 remained perfectly well throughout the experiment.

In this case the cerebro-spinal fluid appears to have contained a small quantity of antitoxin.

Observation 4.—The cerebro-spinal fluid was drawn off five days (Case 10) and six days (Case 9) after intravenous injections of 30,000 units.

No.	Weight in grammes.	Toxin.	Cerebro-spinal fluid.
1	740	0·002 c.c.	+ 1 c.c. (Case 9).
2	770	0·01 ,,	
3	760	0·1 ,,	
4	770	0·002 ,,	+ 1 c.c. (Case 10).
5	720	0·01 ,,	
6	760	0·1 ,,	
		Control.	
7	780	0·001 c.c.	1 c.c. saline solution.

The control animal (No. 7) developed signs on the third day and died on the ninth day. No. 3 and No 6 developed signs within 24 hours and died within 48 hours. No. 2 died of tetanus on the fourth day. No. 5 developed signs of tetanus, was very ill, but just managed to recover. No. 1 and No 4 never showed any signs of tetanus and remained perfectly well throughout.

In these two cases the cerebro-spinal fluid obtained five and six days after intravenous injection of 30,000 units contained small amounts of antitoxin.

The general outcome of these experiments can be summed up as follows: In one case the cerebro-spinal fluid obtained 12 hours after a large intravenous injection was shown to contain a considerable quantity of antitoxin. In four other cases in which the cerebro-spinal fluid was obtained at longer intervals after intravenous injection of antiserum, the amount of antitoxin was small. The presence or absence of antitoxin in the cerebro-spinal fluid is possibly a matter of no great importance.

THE FATE OF ANTITOXIN INJECTED INTO THE THECA.

The intrathecal method is presumably recommended on the assumption that serum introduced into the subarachnoid space is able to reach the nerve centres in the grey matter more rapidly than if it is injected into the general circulation. It is customary after lumbar injection to prop up the foot of the bed to aid in the diffusion of serum towards the upper regions of the cord and the brain.

Observation 5.—The material for this experiment was obtained from Case 2. On Oct. 2nd lumbar puncture was performed; 20 c.c. of cerebro-spinal fluid were removed and 5000 units were injected. Immediately afterwards 10,000 units were injected into the muscles. The foot of the patient's bed was propped up. Twenty-four hours after the lumbar injection a cannula was inserted between the first and second dorsal vertebræ and a sample of cerebro-spinal fluid was withdrawn. An injection of 4500 units was then given at this level. The fluid withdrawn from the upper dorsal region was injected into guinea-pigs as follows:—

No.	Weight in grammes.	Amount of toxin.	Amount of cerebro-spinal fluid.
1	330	0·05 c.c.	5 c.c.
2	330	0·05 c.c.	1 c.c.
3	350	0·0006 c.c.	0
4	350	0·001 c.c.	0

Both control animals died of tetanus: No. 3 within 48 hours and No. 4 on the fifth day. No. 1 and No. 2 showed no signs of tetanus and remained perfectly well.

It is evident that the antiserum does spread upwards within the subarachnoid space.

Observation 6.—One experiment was made with the object of determining the extent to which antitoxin is absorbed from the subarachnoid space. On Oct. 20th the patient (Case 7) was given an intrathecal injection of 5000 units. On Oct. 22nd cerebro-spinal fluid was removed by lumbar puncture (preparatory to another injection). Guinea-pigs were injected as follows:—

No.	Weight in grammes.	Amount of toxin.	Amount of cerebro-spinal fluid.
1	500	0·005 c.c.	1 c.c.
2	450	0·05 c.c.	1 c.c.
3	500	0·0005 c.c.	0

The control animal (No. 3) developed signs of tetanus after 48 hours, and died on the sixth day. No. 2 died of tetanus on the fourth day. No. 1 showed no sign of tetanus and remained quite well.

This experiment appears to indicate that much of the antitoxin had been absorbed from the fluid in the subarachnoid space.

If antitoxin injected into the theca is absorbed, as it appears to be, the question of the path by which it is absorbed becomes a matter of importance. It is probable that normal cerebro-spinal fluid is largely absorbed by the cranial sinuses and meningeal veins. It is not improbable that the greater part of the injected antitoxin follows this route, is carried into the circulation, and is removed from the central nervous system. The possibility of antitoxin passing from the subarachnoid space into the substance of the cord and brain to obtain immediate contact with the nerve cells depends on the existence of communicating channels between the subarachnoid space and the perivascular and pericellular spaces which have been described within the substance of the cord and brain. The existence of such communicating channels has not definitely been proved, and if they exist it seems probable that the flow of fluid would be from the capillary blood-vessels, through the channels, and towards the periphery of the cord and the subarachnoid space. But the antitoxin if it is to reach the nerve cells must traverse these channels in the opposite direction. In any case it is probable that the greater part of any quantity of antitoxin which might be injected would be absorbed by the cranial sinuses and meningeal veins, and that only a small part of it would find its way into the substance of the cord and brain.

In the treatment of tetanus it is obviously desirable to distribute antitoxin to every part of the central nervous system. The arteries and blood capillaries, with which every part of the grey matter is so liberally supplied, afford ideal channels for the distribution of antitoxin to every region of the brain and spinal cord. On the other hand, serum injected into the lumbar region will in time pass up in the subarachnoid space and may filter through to the cells of the cervical cord, medulla, and brain. It is precisely these centres in the cervical cord and in the medulla oblongata which it is most necessary to protect from the tetanus toxin. It is difficult to believe that serum injected into the lumbar theca reaches the cells in the medulla more quickly than serum which is injected into a vein. Moreover, the endothelium of capillary blood-vessels freely permits the passage of an albuminous fluid, the lymph, which bathes the cells of the body, while the cerebro-spinal fluid, the secretion of an epithelium which holds back almost completely the proteins of the blood, is not, under normal circumstances, concerned in the distribution of albuminous substances, and it is difficult to see why it should be chosen as a medium for the introduction of antitoxin to the tissues of the central nervous system. The natural channel for the distribution of an albuminous substance like antitoxin would seem to be arteries and capillary blood-vessels.

ANAPHYLAXIS.

Concerning anaphylaxis, much has been written and little is known. Such information as we possess has been derived for the most part from experiments on laboratory animals. It has been ascertained that different species of animals differ widely from one another both in their susceptibility to anaphylaxis and the symptoms which they exhibit during the attack. Interesting and valuable as many of these observations are, they do not as yet provide all the data required for the elucidation of the problem of anaphylaxis as it occurs in man. The symptoms observed in anaphylaxis fall chiefly into two groups: (1) those associated with anaphylactic shock; (2) various minor symptoms. The conditions under which anaphylactic shock may occur are manifestly of predominant importance, for the minor symptoms of anaphylaxis, although unpleasant, are not associated with danger to life.

It has been established in the case of animals that the second dose, if it is desired to produce shock, should be given by intravenous or intracerebral injection. In the case of an antigen, which is in itself comparatively non-toxic (e.g., the serum of an animal of different species), it is difficult to produce anaphylactic shock if the second dose is injected into the muscles or beneath the skin. All, however, who have carried out experiments on anaphylaxis are aware that animals differ enormously in their individual susceptibility, and even under laboratory conditions the peculiarities of individual animals render attempts at generalisation very difficult. Even under the most favourable conditions a certain proportion of a batch of animals fail to exhibit shock even if a suitable dose has been injected into a vein. One of the most interesting, and for our immediate purpose valuable, of the results obtained in the laboratory is the observation that acute anaphylactic death does not occur if the animal at the time of the second inoculation is under the influence of an anæsthetic.

Of the 25 patients 14 were given large intravenous doses of serum.

One patient (Case 17) died while still under the anæsthetic, shortly after the serum had been injected. There was no reason to think that death was due to anaphylaxis.

In one case only (No. 18) of the remaining 13 did shock occur. The signs of shock made their appearance after the patient had recovered consciousness. The skin was pale and cold, the pulse small and rapid, the respirations shallow. The shock was accompanied by urticaria and œdema of the eyelids.

An urticaria followed within a few minutes of the intravenous injection in four other cases and was unaccompanied by any sign of shock. The urticaria covered the whole body. It was first noted on the face or backs of the hand. In several cases when the clothing was opened to look for the rash no urticaria was seen until the part had been exposed for some seconds—that is to say, the rash appeared to spread in turn to each part of the body as it was uncovered. The urticaria had usually disappeared at the end of half an hour.

The œdema of eyelids which was noted for the first time in Case 17 was seen in one other case (No. 18), on which occasion there was no sign of shock, and the pulse, respiration, and general condition were excellent throughout and after the injection. The œdema was perfectly definite and was more obvious in the upper lid, the appearances resembling those seen in renal disease.

Quite recently I have had the opportunity of observing in one other case symptoms possibly due to anaphylaxis.

About 50 c.c. of serum had been given, when, as it was noticed that the needle had slipped out of the vein, the injection was interrupted. It was found necessary to re-sterilise a piece of rubber-tubing, and before this had been done the respirations were observed to be shallow and intermittent. The patient had partly come round from the anæsthetic. Respiratory movements ceased for a few minutes, and the pulse became small and rapid. Respiratory movements were resumed after a period of artificial respiration. Slight urticaria and œdema of the eyelids were observed in this case. An intramuscular injection of 6000 units had been given earlier in the day. In the case already described (No. 18) in which shock was observed an intramuscular injection of 6000 units, probably about 25 c.c. of serum, had been given about six hours before the intravenous injection.

Table II. shows the intervals which elapsed in each case between the last subcutaneous or intramuscular dose of serum and the intravenous injection.

In 5 cases no serum was given between the prophylactic dose in France and the intravenous injection. Of these 5 cases, 1 showed an urticaria after the intravenous injection. In the other 8 cases intramuscular or subcutaneous doses of serum had been given as treatment before the intravenous injection. Of these 8 cases, shock, urticaria, and œdema of eyelids were observed in 1, urticaria and œdema of eyelids in 1, and urticaria in 2. In Case 20, for example, 2000 units had been injected on the same day as the intravenous injection and on each of the four preceding days. Nevertheless, the intravenous injection was followed by urticaria and œdema of the eyelids.

There seems no reason, from this series of cases, to suppose that preliminary doses of serum are likely to prevent the occurrence of anaphylactic phenomena. It is well known to laboratory workers that rabbits during the process of immunisation against an alien serum, in which the inoculations are given at three-day intervals, often show anaphylactic symptoms.

It must be admitted that 14 is not a very large number of cases from which to generalise, but the results obtained seem to show that no very great risk attaches to the intravenous injection of serum under deep chloroform anæsthesia. On the other hand, the results obtained as regards treatment were good. An urticarial rash, accompanied in some cases by other symptoms of "serum sickness," occurred in nearly all the cases on the fifth day after the intravenous injection. In several cases an increase of the tetanic spasm was observed during the period of the rash, and the impression was often produced that the tetanus was worse. The exacerbation of symptoms came to an end on the following day in every case. This rather interesting phenomenon was possibly due to the increased irritation and stimulation of afferent nerves as a result of the serum sickness.

AMOUNT OF SERUM REQUIRED FOR TREATMENT AND QUESTION OF REPEATED DOSES.

It is very generally held that injections of serum should be given at frequent intervals until every sign of tetanus has disappeared. It is, however, obvious that there is no need to give a second dose while there is still a large amount of free antitoxin in the circulation. The condition of the patient gives us no information on this point.

The appearance of definite signs of tetanus is evidence that the toxin has got a long start, and a large dose of antitoxin should immediately be given. A large dose is needed for the rapid neutralisation of free toxin, and if it is possible to dissociate toxin which has already reached the nerve cells the larger the dose the better. The effect of a suitable dose is to arrest the progress of symptoms. The antitoxin exerts no curative effect on the nerve cells which have been damaged. The possibility of further damage is averted and an interval must elapse before the damaged elements of the central nervous system recover. In this series of cases after the injection of 30,000 units there was, as a rule, no definite improvement until the fourth and sometimes until the seventh day. In one or two cases the signs were slightly more marked during the ensuing 48 hours. Nevertheless, there was probably plenty of free antitoxin in the blood stream during the week which followed the intravenous injection. With the object of obtaining definite information several experiments were carried out.

Observation 7.—The patient (Case 4) had a subcutaneous dose of 1500 units on Oct. 13th and on Oct. 14th 30,000 units were injected into a vein. This man had no subsequent injections. On Oct. 20th a specimen of blood was obtained and the following experiment was carried out with the patient's serum:—

No.	Weight of guinea pig in grammes.	Amount of toxin.	Amount of patient's serum.
1	500	0·005 c.c.	1 c.c.
2	500	0·05 ,,	1 ,,
3	500	0·0005 ,,	0

The control animal No. 3 developed signs on the third day, and died of tetanus on the sixth day. No. 1 and No. 2 remained perfectly well and never developed any signs of tetanus.

Another specimen of the patient's serum was obtained on Oct. 31st, 17 days after the intravenous injection. On the same day blood was taken from another patient (Case 11) on the eighth day after the intravenous injection.

No.	Weight of guinea-pig in grammes.	Amount of toxin.	Amount of serum.
1	780	0·01 c.c.	1 c.c. (Case 4).
2	750	0·01 ,,	1 ,, (Case 11).
3	750	0·1 ,,	1 ,, (Case 11).
4	750	1·0 ,,	1 ,, (Case 11).
		Controls.	
5	690	0·001 c.c.	3 c.c. Normal serum.
6	850	0·001 ,,	2·5 ,, ,, ,,
7	800	0·001 ,,	0

Of the controls, No. 7 developed signs of tetanus on the sixth day, was very ill, but eventually recovered. No. 5 developed signs on the fourth day and died on the eighth day. No. 6 developed signs of tetanus on the third day and died on the seventh day. Nos. 1, 2, 3, and 4 never showed any signs of tetanus and remained well.

Observation 8.—The sera for this experiment were obtained from Cases 15 and 18. In the one case (15) the patient was given an intravenous injection of 30,000 units on Nov. 10th. The patient had no other injection of serum, and a sample of blood was taken 39 days later, on Dec. 19th. The second patient was given an intramuscular injection of 6000 units and an intravenous injection of 30,000 units on Dec. 3rd and an intramuscular injection of 5000 units on Dec. 7th. Blood was taken on Dec. 19th.

No.	Weight of guinea-pig in grammes.	Amount of toxin.	Amount of serum.
1	650	0·01 c.c.	+ 1 c.c. (Case 15).
2	650	0·1 ,,	
3	650	1·0 ,,	
4	650	0·01 ,,	+ 1 ,, (Case 18).
5	620	0·1 ,,	
6	650	1·0 ,,	
7	670	0·001 ,,	+ 0
8	650	0·002 ,,	
9	650	0·004 ,,	

Of the controls, No. 9 showed signs after 24 hours, and died of tetanus on the third day. No. 7 and No. 8 developed signs on the second day. No. 8 died of tetanus on the eighth day and No. 7 on the fifteenth day. Of the animals inoculated with serum from Case 15, No. 3 had generalised spasms within 24 and died within 48 hours. No. 2 showed signs of tetanus on the eighth day, but had recovered by the twelfth day. No. 1 showed no signs of tetanus. Nos. 4, 5, and 6 never showed any signs of tetanus.

Observation 9.—Experiments on exactly the same lines were carried out in connexion with Cases 20, 23, 24, and 25.

No of case.	Interval between intravenous injection and collection of blood	Amount of toxin neutralised by 1 c.c. of patient's serum.	Amount of toxin fatal to guinea-pigs of same weight.
20	30 days.	0·04 c.c.	0·003 c.c.
23	25 ,,	0·4 ,,	
24	20 ,,	0·02 c.c.	0·0005 c.c.
25	19 ,,	0·02 ,,	

None of these patients had any more serum after the intravenous injection. The animal injected with 0·4 c.c. toxin and 1 c.c. of serum from Case 20 developed no sign of tetanus, but unfortunately died on the fourth day after inoculation.

The results obtained from the above experiments show that 20, 30, and even 39 days after a single intravenous injection of 30,000 units the blood of the patient may contain appreciable quantities of antitoxin. It is possible that some of the antitoxin, the presence of which was

demonstrated, was not the antitoxin originally injected but was antitoxin manufactured by the patient. This possibility need not, however, be discussed, as the object of the experiments was to obtain evidence as to the necessity of giving repeated doses of serum. The evidence provided by the clinical histories confirms the experimental results. Of the 13 patients, seven received no further serum treatment after the intravenous injection, while the other six were given one or more additional doses of serum by intramuscular or subcutaneous injection. If the histories of the patients in these two groups are compared, no difference in the rapidity of the disappearance of symptoms is apparent.

These 13 cases afford no evidence in favour of frequent injections of serum.

THE EMPLOYMENT OF HYPNOTIC AND SEDATIVE DRUGS.

The drugs employed in the treatment of these 25 patients were morphia, potassium or sodium bromide, and chloral hydrate. The extent to which hypnotic drugs were employed varied enormously in the different cases.

One patient appears to have consumed during seven days about 10 drachms of potassium bromide and 10 drachms of chloral hydrate. At the end of this period the patient was in a sleepy and comatose condition and the pulse was small, rapid (130), and irregular. Nevertheless, in spite of the very considerable quantity of drugs which had been given, there was well-marked spasm of the jaw, neck, abdomen, and thigh.

On the other hand, in several cases the number of doses of hypnotics given was very small, and in a few no hypnotics were given at all. The majority of the patients to whom but few doses of hypnotic drugs were given made good recoveries and their general condition was far more satisfactory than that of those who had received frequent doses of drugs.

Tetanus toxin is a very efficient poison to the central nervous system and drugs such as chloral and morphia, which are also essentially poisons to the nervous system, should, in the opinion of the writer, be used with considerable caution.

The use of hypnotic drugs in the treatment of tetanus should probably be restricted to the minimum necessary to relieve violent pain and secure necessary sleep. The amount of hypnotic drugs which is absolutely essential must be ascertained by direct trial for each patient. In those cases in which pain can be moderated and sleep secured by relatively small doses, it is unnecessary and probably injurious to give larger amounts. In tetanus, as in other toxic conditions, the less morphia and chloral are given the better are the patient's chances of recovery.

SUMMARY AND CONCLUSIONS.

1. All the 25 patients had had suppurating wounds, but in the majority of cases the wounds were not more serious, and the suppuration had not been more considerable than in the average case sent home to a hospital in England. In 4 cases the wounds were of a comparatively trivial nature. In 9 cases the wounds at the time of the onset of tetanus had completely or almost completely healed. If every wounded soldier, irrespective of the size or condition of the wound, was given a prophylactic injection on his arrival in this country, there would in all probability be a still further reduction in the number and severity of cases of tetanus.

2. Compound fractures are a particular source of danger, and were present in 11 of 25 cases of tetanus.

3. In 3 of the 25 cases the disease ran an extremely short and mild course. These were the only three patients who had received a prophylactic injection after their arrival in England.

4. One result of prophylactic injection is to prolong enormously the incubation period, with the result that tetanus may occur after the wounds have completely healed, and the patient has been transferred to a convalescent hospital. Under these circumstances the earliest signs are readily overlooked.

5. The pain associated with the early and local symptoms may lead to a diagnosis of rheumatism or muscular rheumatism.

6. The earliest signs may consist of clonic or tonic contraction of muscles in the immediate neighbourhood of a wound, usually in the nearest flexor group. The signs may remain localised for many days, and it is characteristic of some cases occurring in inoculated patients that the period of onset is enormously prolonged.

7. After a longer or shorter interval generalisation occurs. The muscles of the jaw, neck, and abdomen become stiff. There is profuse perspiration and the reflexes of the lower limbs are exaggerated. In many cases the pulse-rate may be very rapid and the temperature normal. On the other hand, even in inoculated persons and after a very long incubation period, the disease may begin suddenly with spasm of the muscles of the jaw and neck.

8. Of 5 mild cases treated by intramuscular and subcutaneous injections of serum 5 recovered. Of 14 cases treated chiefly by intravenous injections 13 recovered. Of 5 cases treated by intrathecal with or without other injections 3 recovered. One patient who was given an intravenous and subsequently an intrathecal injection died. If the signs are well localised and are not spreading rapidly intramuscular injections afford an adequate method of treatment. In severe cases, and in those in which signs are generalised, an intravenous injection (30,000 units) under deep chloroform anæsthesia should be given. After such injection the further progress of the disease is usually arrested, and definite improvement may be expected two to seven days later.

9. There is reason to think that the danger of intravenous injection has been exaggerated. The essential principle of serum treatment is to give a very large dose of antitoxin at the earliest possible moment. This object can be most easily attained by the intravenous route.

10. In 4 cases serum treatment was confined to a single intravenous dose of 30,000 units. In 3 other cases no serum was given subsequent to the intravenous injection. In these 7 cases recovery was as rapid as in 6 other cases in which subsequent injections were given. The serum of patients was shown to contain free antitoxin at various intervals up to 39 days after an intravenous injection of 30,000 units.

In conclusion, I desire to express my thanks to Captain Telford who has kindly given me permission to include one of his cases in this series. To Dr. MacConkey, who supplied the tetanus toxin which was used in the experimental portion of the work, my best thanks are due. I also wish to express my thanks to Major Turner, Captain Morley, Captain Walker, and other medical officers in charge of military and auxiliary hospitals who have helped me by supplying material and information which have been of the greatest service in the preparation of this report.

THE INTRAMUSCULAR *VERSUS* THE INTRATHECAL ROUTE IN THE TREATMENT OF TETANUS BY THE INJECTION OF ANTITOXIN.

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THE Tetanus Committee has been labouring for a long time trying to impress Army medical officers with the importance of the recognition of the earliest symptoms of tetanus and that time is the all-important element in serum treatment. A delay of an hour may make all the difference between success and failure. It is, therefore, obvious that it is necessary to give antitoxin by the method which enables it to produce its effect with the least delay.

In THE LANCET of Jan. 27th, 1917, a paper appeared, entitled "An Analysis of Recent Cases of Tetanus in the British Expeditionary Force," by Colonel Sir William B. Leishman, A.M.S., and Major A. B. Smallman, R.A.M.C. In this paper it is laid down that the best and most effective route for the injection of antitetanic serum is the intramuscular. As chairman of the Tetanus Committee I have been deputed by the members to question this statement.

In the Memorandum on Tetanus published in November, 1916,[1] the Committee stated that "experimental and clinical evidence has shown that the best results are obtained by intrathecal injections of serum"; and, again, "in a case of tetanus the first thing to do is to give an intrathecal injection of antitoxin." Sir William Leishman and Major Smallman, on the other hand, as the result of the study of their figures, write: "They appear to us to throw very considerable doubt upon the advisability of employing the intrathecal route, either alone or in combination; and, further, they seem to indicate considerable virtues in connexion with the

[1] THE LANCET, Nov. 18th, 1916, p. 873.

employment of the subcutaneous and intramuscular channels, particularly the latter." Also, "We find our suspicions of the thecal and venous routes strengthened, and also some further support for the good impression which has been made on us by a consideration of the results of the subcutaneous and intramuscular routes." In regard to the intrathecal route they consider "that the evidence is pretty strongly against its employment." In conclusion, they place the alternative routes in the following order of merit: intramuscular, subcutaneous, intrathecal, and intravenous.

The difference of opinion on this important point between the Committee and Sir William Leishman and his colleague is therefore plain and manifest. This statement by Sir William Leishman and Major Smallman is even now having a marked effect in the treatment of tetanus in England. Already letters have been received from inspectors of tetanus saying that it will be difficult, if not impossible, in future to get intrathecal injections carried out promptly. It is so much easier to give an intramuscular injection. "Facilis est descensus." Given the choice between the straight and narrow intrathecal route and the broad and easy intramuscular, it is not to be wondered at if the majority choose the latter.

In this paper it is proposed to confine the issue strictly to the thesis, intramuscular *versus* intrathecal injections. It is doubtful if any truth can be arrived at by the study of the figures at our disposal relating to the result of injections of antitoxin in the human subject. There is no uniformity in the treatment of tetanus in man. The men who suffer are also, as a rule, suffering from other grievous maladies—wounds, fractures, septicæmias, pneumonias, heart failure, &c., so that if the man dies it is impossible in many cases properly to assign the cause. But when we take experimental animals to which a constant dose of the poison can be given and in which the effect of the antitoxin can be carefully watched, we are in a much better position to adjudicate on a simple question such as the merits of the two methods of injection. An ounce of experimental fact is worth a ton of speculation. The only argument brought forward, then, will be one based on animal experiment. This, it is hoped, will be considered legitimate, although there is a great difference between tetanus in man and in an experimental monkey. In the former there are living tetanus bacilli, in the latter a weighed quantity of the dead poison. But the question asked in this paper is a restricted one, "Which is the better route—the intrathecal or the intramuscular?" and in trying to arrive at the correct answer an argument taken from animal experiment seems not only to be a fit and proper one, but the only sure one available. The animal used in this experiment is the monkey, and the experimenter is Professor C. S. Sherrington, a member of the Tetanus Committee. The following is a description of the experiment in his own words:—

Some experiments recently conducted at the request of the Committee upon monkeys bear on the relative efficacy of the serum treatment by intramuscular and intrathecal injection respectively. The experiments exhibit the effect of a single injection of antitetanic serum upon a single precurrent dose of tetanus toxin. They show a difference between the results obtained by the intramuscular and intrathecal methods respectively. The contrast seems sufficiently marked to be significant, although the experiments are at present few in number.

For the experiments the same sample of toxin was used throughout. It was kindly provided by Dr. A. T. MacConkey, of the Lister Institute. The minimal lethal dose of it for the monkey was not ascertained; but in eight control experiments carrying the dose down to 0·8 mgm. per kilo. monkey it proved lethal in all, none of the animals surviving the inoculation longer than 5½ days, and all dying of generalised tetanus. These observations have now been carried down to 0·5 mgm., which likewise killed the animal, but less quickly.

The mode of giving the toxin was the same in most of the cases: the weighed dose was inserted as the dried powder into a small cross-cut about 8 mm. long and 4 deep cut in the outer head of the left gastrocnemius muscle; the lips of the muscle wound were then drawn together by a single fine suture and the skin wound closed by stitches. This inoculation and the subsequent injection of antitetanic serum were made under full anæsthesia and with full aseptic precautions. Some of the later experiments have been made with the toxin in solution.

The antitetanus serum used was likewise kindly provided by Dr. MacConkey and its values in U.S.A. units were supplied by him. It was of various degrees of strength in units per c.cm. In comparative pairs of experiments the sample concentration used was the same.

For the *intramuscular* injections the serum was given in the usual way—under light chloroform anæsthesia; the shaved skin was cleansed and swabbed with iodine; the site chosen was the muscles one-third down the back of the thigh of the limb which had received the toxin. When, as was often the case, the quantity of serum injected was large, part of the dose was given into the muscles at the back of the neck. No local inconvenience resulted to the animal from these injections.

For *intrathecal* injection the animal was anæsthetised, the skin of the top of the back of the neck shaved, cleansed, and swabbed with iodine, and then the atlo-occipital membrane was exposed by suitable incision. Some of the cerebro-spinal fluid was then withdrawn with the syringe needle thrust through the membrane, and without withdrawing the needle the antitetanus serum was then injected. It was usually not possible to introduce more than 3 c.cm. of serum. The needle was then withdrawn and the wound closed with deep and superficial stitches under full asepsis.

A factor of high importance as influencing the success of the serum treatment is length of time elapsing between the giving of the serum and the giving of the toxin; the shorter this interval the more favourable the opportunity for the serum to have effect. This factor and the amount of the dosage of the toxin and serum are exhibited in the accompanying table.

TETANUS TOXIN EXPERIMENTS.

Intramuscular and Intrathecal Injections of Antitetanic Serum Compared.

Monkey's expt. cage number.	Dose of toxin in mgm. per kilo. of monkey.	No. of hours from inoculation of—		Dose of serum in units per kilo. monkey.	Result.
		Toxin to first symptoms	Toxin to giving serum.		
		Intramuscular.			
XXXII.	3·5	29	66	2320	Death in 5½ days.
VII.	2·4	30	66	1360	,, 6¼ ,,
XXXV.	2·0	30	54	1200	,, 10¼ ,,
LXXV.	2·0	30	50	1600	,, 7½ ,,
LXXVII.	2·0	30	74	2100	,, 5½ ,,
XXXIII.	1·8	30	69	1480	,, 5½ ,,
XXIV.	1·7	30	68	2518	,, 11½ ,,
XLI.	1·6	30	50	2083	,, 5½ ,,
IV.	1·6	30	72	850	,, 4½ ,,
XXXVI.	1·5	30	54	1300	,, 12½ ,,
XL.	1·3	30	74	1365	,, 5½ ,,
XXXVII.	1·1	30	93	1250	,, 9½ ,,
		Intrathecal.			
XVII.	4·4	28	78	1407	Death in 5½ ,,
XIX.	4·3	28	78	1956	,, 8½ ,,
XI.	3·5	29	69	1000	Recovery.
XII.	2·7	30	78	910	Recovery.
IX.	2·7	30	69	300	Death in 4½ days.
XX.	2·2	30	71	1478	Recovery.
XXIII.	2·1	30	68	1085	Recovery.
LI.	2·0	28	51	1500	Recovery.
L.	2·0	28	51	1600	Recovery.
XXVI.	2·0	30	54	560	Recovery.
XLVII.	2·0	30	51	1000	Recovery.
LXXVIII.	2·0	30	72	1600	Recovery.
LXV.	2·0	30	78	2250	Death in 5½ days.
LVI.	2·0	34	66	1800	Recovery.
XXVIII.	1·9	30	54	711	Recovery.
III.	1·8	30	72	966	Recovery.
XXXIX.	1·3	30	74	1200	Recovery.
XXIX.	1·1	30	93	571	Death in 11½ days.

It will be seen from the table that the results are distinctly in favour of the efficacy of the intrathecal as against the intramuscular method.

For instance, with a toxin dose of 3·5 mgm. per kilo. monkey, serum in a dosage of 2320 units per kilo. animal, given intramuscularly 66 hours after the toxin, hardly appreciably prolonged life; whereas by the intrathecal method the serum in a dosage of 1000 units per kilo. animal, given 69 hours after the toxin, was followed by recovery.

Again, with a toxin dose of 2·4 mgm. per kilo. animal, serum in a dosage of 1360 units per kilo. animal given intramuscularly 66 hours after the toxin, was followed by death from generalised tetanus in 6¼ days; whereas with toxin 2·7 mgm. per kilo. animal, serum in a dosage of 910 units per kilo., given intrathecally 78 hours after the toxin, was followed by recovery.

Again, with a toxin dose of 2 mgm. per kilo. animal, serum in a dosage of 1200 units per kilo. animal, given intramuscularly 54 hours after the toxin, was followed by death from generalised tetanus in 10¼ days; whereas with the same dose of toxin, serum given intrathecally at the same period after the toxin, in dosage of 560 units, was followed by recovery.

Again, with 1·3 mgm. toxin per kilo. animal, serum in the dosage of 1365 units per kilo., given 74 hours after inoculation intramuscularly did not obviously retard the fatal result. But with the same dosage of toxin, serum given intrathecally

after a similar lapse of time from the toxin inoculation and in somewhat smaller dosage (1200 units per kilo.), was followed by recovery.

Of the group of 12 animals treated intramuscularly none recovered. Of the group of 18 animals treated intrathecally 13 recovered. But the contrast is more marked than that simple comparison might suggest. Reference to the table shows that in the case of one (IX.) of the intrathecal experiments the dose of serum given was much smaller than was tried in any of the intramuscular experiments. In another case (XXIX.) it was less than half the amount given in the experiment (XXXVII.) most comparable with it in the intramuscular group. Further, the doses of toxin given in two other animals which died in the intrathecal group were larger than any of the toxin doses administered under the intramuscular group.

Can any unbiassed person examine Professor Sherrington's results and not be struck at the manifest superiority of the intrathecal over the intramuscular route? In the cases treated intramuscularly the disease was hardly retarded in its fatal result, whereas almost all those treated by the intrathecal route recovered; the few that died had either too much toxin or too little serum given. The proof of the pudding is in the eating of it. Here is no *in vitro* experiment, but definite living animals all stricken by a mortal malady. Treated intramuscularly they all die. Treated intrathecally the great majority live.

ON THE INTRATHECAL ROUTE FOR THE ADMINISTRATION OF TETANUS ANTITOXIN.

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With a Note on a Case of Tetanus Successfully Treated. By F. W. ANDREWES *and* THOMAS J. HORDER, M.D. Lond., F.R.C.P. Lond.

THERE are six routes by which tetanus antitoxin may be given in curative treatment. Of these the intracerebral and intraneural routes are unsuited for regular use, and are, by common consent, reserved for special and desperate cases. The other four routes are the subcutaneous, intramuscular, intravenous, and intrathecal; at the present time opinions are still widely divided as to the relative advantages of these. While I am personally an advocate of the intrathecal route, I recognise that there are other observers with an equal right to judge who prefer one or other of the alternative routes. My purpose in this paper is to record my own experience of the intrathecal route, and to set forth, as far as I am able, the reasons which weigh with me in my preference.

It is of interest to analyse the influences which are at work in determining individual judgment on such a matter. The most powerful influence is, I imagine, personal experience; the man who has the misfortune to lose one or two cases early in his trials of a given route naturally conceives a prejudice against it, while with another, who happens to meet with success, the reverse is the case. Failure, no less than success, is apt to occur whatever be the route chosen, and thus chance comes to play some part in one's preference. The military cases of tetanus which are now occurring in this country are not very numerous, for the prophylactic injection of antitoxin has largely controlled the disease, and most of the cases which occur in spite of the injection are greatly modified in their severity, many being cases of local tetanus only. It is probable that a large proportion of these milder cases would recover whatever the route of administration of the serum, or even without serum at all. It thus comes about that the advocate of any route is able to bring forward lists of cases with a large percentage of recoveries, so that it has become more difficult than before to appraise the relative values of the different routes.

Conclusions derived from Statistical and Physiological Data.

A common method by which attempts have been made to reach a decision is the statistical one. If we had sufficiently large series of comparable cases treated each with comparable doses of serum by the four different routes separately it might be easy to draw conclusions from the relative case-mortalities of each series. But such data are not forthcoming, and we shall probably never get them, for the primary object is always the cure of the patient. As a rule, more than one route is employed in any given case, and the widest discrepancies exist not only as to choice of route but as to dosage of serum, while different cases of tetanus present extreme variations in severity. It does not seem legitimate to draw any conclusions from the heterogeneous mass of data at present available. In his analysis of the cases of tetanus occurring in this country during the first year of the war, Surgeon-General Sir David Bruce found that the mortality was a little lower in those who had received intrathecal injections of serum than in those who had not; but when he came to apply a similar analysis to the cases occurring in the second year of the war this advantage was no longer seen. Last January Colonel Sir W. B. Leishman and Major A. B. Smallman published an elaborate and exhaustive analysis of 160 cases occurring amongst our troops in France during last summer and autumn[1]; their figures brought out the surprising result that the highest mortality was amongst the cases which had received an intravenous injection, while the intrathecal route was not much better; the best apparent results were achieved by the subcutaneous and especially by the intramuscular routes. They state that they are fully aware of the many pitfalls incident to the search for truth amongst small figures dealing with cases presenting many complicating factors, and perhaps the most serious of these are the facts that no less than 61 out of their 113 fatal cases had gas-gangrene, and that cases are included as fatal cases of tetanus whether they died of tetanus or of some complication. Thus of 21 fatal cases treated by intrathecal injection only, 9 were attributed by the reporting officer to causes other than tetanus. There is a natural tendency to employ the more heroic measures of intravenous and intrathecal injection in the more desperate cases and to be content with the simpler procedures in slighter cases; I have certainly been influenced by this tendency myself. Taking into consideration all these sources of fallacy, I cannot but feel that argument from such confused statistical data is a somewhat hazardous proceeding.

There is a third method of justifying a preference for a certain route which is also hazardous. This consists in *a priori* reasoning from supposed physiological data. It is, for example, common to hear it said that the intrathecal route must be the best because thus the antitoxin is brought into the closest relation with the central nervous system; while others, again, defend the intravenous route because the antitoxin is thus carried into the closest attainable contact with the affected motor neurons. The fallacy of such reasoning lies in the fact that it rests on insecure physiological premisses. There is no actual proof that antitoxin can pass from the cerebro-spinal fluid into the substance of the central nervous system, nor any proof that it can reach the neurons from the capillaries adjacent to them. There is no proof that, if these things were true, the antitoxin could dissociate from the neurons the toxin which had already entered into combination with them. Many physiologists hold opinions on these points and arguments can be arrayed on either side, but we have not sufficient proof, or even consensus of opinion, to enable us to reason safely on such a difficult subject as this.

The Method of Experiment.

There remains one method which has been helpful in deciding many vexed questions: it is that of experiment, and I must confess that I place more reliance on this than on any other method in deciding on a choice of route. Though we cannot get "clean data" from human cases of tetanus they can be obtained by animal experiment. It is possible to introduce known and similar doses of tetanus toxin into series of animals, allow the disease to commence, and then determine the route by which equal suitable doses of antitoxin are most successful in saving or prolonging life. More than one series of experiments has been carried out on these lines. In Denmark Permin showed that when tetanus toxin was injected into the muscles in suitable dose local tetanus was prevented when antitoxin was given intrathecally at the same time, whereas it was not prevented by the same dose of antitoxin given intravenously; not even intrathecal injection prevented tetanus if it was given four hours after the toxin. Permin

[1] THE LANCET, 1917, i., 131.

used dogs and rabbits in these experiments. More often quoted is the work of Park and Nicoll on guinea-pigs. These observers injected into the muscles of the hind leg two minimal lethal doses of toxin, waited till spasm of the leg commenced, and then tried antitoxin by various routes. In one experiment on 18 guinea-pigs the 2 controls without antitoxin died in three days; 6 received 100 and 200 units of antitoxin by the intracardiac route, and 4 received 200 units by the intraneural route; all these 10 animals died in from three to eight days. The remaining 6 received intrathecal doses, 3 getting only 10 units and 3 50 units; 5 out of these 6 animals recovered. This is only one out of four experiments they record, but in all the same marked superiority of the intrathecal route was manifest. It has been objected to these experiments that it is impossible to give an intrathecal injection in such small animals without wounding the cord, and it is probable that they did sometimes wound it, as they state that transitory paralyses of the hind legs followed the injections in a few cases. But whether or not these were pure intrathecal injections the animals nearly all recovered from two minimal lethal doses of toxin, whereas nearly all those treated by other routes perished, and this although the intrathecal doses of antitoxin were much smaller than those given by the other routes. Captain Golla has done similar experiments on cats and rabbits. He finds the intrathecal and intravenous routes greatly superior to the subcutaneous in saving life.

Quite recently Professor C. S. Sherrington has carried out for the War Office Committee for the Study of Tetanus a series of experiments on monkeys on similar lines to the above, and these he is now publishing. He permits me to state that when symptoms of tetanus have commenced the intravenous and intrathecal routes for administering antitoxin have proved vastly superior in prolonging or saving life to the intramuscular route, the intrathecal being slightly superior to the intravenous. It may thus fairly be said that in experimental work where the dosage of toxin and antitoxin can be accurately controlled and the experiments rendered strictly comparable the available evidence indicates the intrathecal route as the most effective in saving life in animals in the early stages of tetanus. I think that great weight must be attached to such evidence, and it seems to me that we should be justified in refusing to employ the intrathecal route in suitable human cases, only if it could be shown that grave risk attaches to the method; this with reasonable care I believe not to be the case. I will refer later to another argument relating to the risk of anaphylactic shock.

Results of Intrathecal Injections.

Such are my reasons for preferring the intrathecal route, and I will now state shortly the results which I have seen from its use during the past six months. Since the middle of September, 1916, I have acted as tetanus inspector for the military hospitals in the London District north of the Thames. It has been my duty to see at once every case or suspected case of the disease, to take notes, and to confer with the medical officer in charge of the case as to treatment. In six months I have been summoned to 24 cases. One of these was clearly not tetanus, and 3 were convalescent cases which had received their treatment in France. Twenty cases were, in my judgment, tetanus, or sufficiently like it to be treated as such, though in one or two instances of such extremely mild type as to be somewhat doubtful. Many of the cases I saw but once in consultation, though in all I kept in touch with the responsible medical officer till the upshot of the case was clear. Some of the cases had already been receiving serum treatment before I was sent for, but in most I felt it my duty to urge the administration of large doses of antitoxin by the intrathecal route, and this was usually done. Sixteen out of the 20 received intrathecal treatment. One case received no serum treatment at all. The cases have presented every gradation from the most acute general tetanus to the mildest local form of the disease. I will endeavour to group them more or less in the order of their severity.

Cases of Acute General Tetanus.

CASE 1.—Severe burns of face, neck, back, and limbs. Patient had rolled in mud to extinguish flames. No prophylactic dose of antitoxin. Incubation 10 days. Onset with trismus and difficulty in swallowing. Serum treatment not commenced till third day, when 16,000 U.S.A. units were given intrathecally and 8000 units intramuscularly. These doses were repeated on the following day, but the patient died in violent opisthotonic spasms on the night of the fourth day.

CASE 2.—Appendicectomy. No antitoxin given. Incubation nine days. Onset with trismus, stiff neck, and twitching of abdominal muscles. Serum treatment begun on second day—12,000 units intravenous and 12,000 intramuscular. These doses were repeated on the following day, after which only subcutaneous doses were given. Patient held his own for four days and then died from heart failure rather than from any violent muscular symptoms. *B. tetani* was recovered from the wound and from a snipping of the appendix stump after death.

CASE 3.—Gunshot wound of loins; flesh wound only. 1500 units antitoxin on following day. Incubation 10 days. Onset with fever, frequent pulse, and delirium. Jaws and neck stiff; back and shoulder muscles quivering, but no opisthotonic spasms. Received 8000 units of antitoxin intrathecally and 1000 into muscles of back on day of onset, and 27,000 units intrathecally on the following day. Nevertheless, he died about 48 hours from onset, not from manifest tetanus, but from profound toxæmia.

CASE 4.—Gunshot wound of right femur, followed by gas gangrene. Presumably had had antitoxin. Patient's general condition became bad, and the condition of the leg was such that amputation was performed two and a half months after the injury. Previous to this operation the patient had at times complained of transient stiffness of the jaw and neck. Incubation 85 days from wound, six days from amputation. The earliest symptoms were trismus and stiff neck, and these lasted four days before tetanus was definitely diagnosed. The patient then had a convulsive seizure and died a few hours later while preparations were being made to give antitoxin. Apart from the tetanus, his general condition was so bad as to give little hope of his recovery.

CASE 5.—Shrapnel wound of loins, not involving bone. Patient not aware that he had had antitoxin. Wound dirty at first, then granulated healthily. Incubation 14 days. Onset with feeling of constriction round waist and rising temperature. On the third day slight trismus, difficulty in swallowing solids, and stiff neck. On the fourth day marked trismus and opisthotonic spasms, with sweating. Serum treatment commenced on fourth day—1000 units subcutaneously in the morning; in the evening 16,000 units intrathecally and 8000 intravenously. On the fifth day again 16,000 intrathecally and 8000 intravenously. On the sixth, seventh, and eighth days 12,000 units were given each day intrathecally. The general spasms ceased after the first intrathecal and intravenous doses and the trismus was gone in a week. Recovery was complete.

CASE 6.—Shrapnel wound of knee, penetrating joint. Antitoxin same day and again about five days later. Shrapnel removed from joint. Wound healed completely. Movement of knee good. Incubation 48 days. Onset with lumbar pain and sweating. After 24 hours slight rigidity of lumbar muscles. After 48 hours back and neck stiff, marked trismus, sweating, commencing opisthotonic spasms. No symptoms in wounded limb. Serum treatment commenced at end of second day—12,000 units intrathecally and 12,000 intramuscularly. Similar doses next day, and half these doses on day following. Improvement was immediate, and the trismus had nearly disappeared by the fifth day. Recovery complete. Marked serum rash after third intrathecal dose; œdema of face lasted for weeks.

Cases of Subacute or Mild General Tetanus.

CASE 7.—Compound fracture of right mandible by fragment of high-explosive shell. Antitoxin given same day. Three days after injury fragment of shell removed from jaw. A dental splint fitted later. Incubation 19 days. Onset with slight trismus. Tetanus not diagnosed for six days, when the spasm had spread to neck, back, and abdomen; restlessness and delirium. 1500 units antitoxin given subcutaneously on the seventh, eighth, eleventh, and thirteenth days; 1500 intrathecally on the fourteenth day, after which the same subcutaneous doses were repeated, with occasional doses of an antibacillary serum. On the twenty-seventh day there was still some rigidity of the abdomen, with increased knee-jerks and ankle-clonus; on this day the patient had 12,500 units intramuscularly. The tetanus finally disappeared about the fortieth day, but the patient remained delirious till he was put on fuller diet. Recovery was complete.

CASE 8.—Compound fracture of right tibia. Bit of high-explosive shell removed same day and antitoxin given. The wound remained foul, and some two months after the injury the cavity was scraped and dressed daily with phenol and camphor, when it became clean. Incubation 107 days. Onset with slight stiffness of jaw and neck, not recognised as tetanus for a week, when the rigidity was more marked and had spread to the abdomen. The tongue was bitten during the night by a spasm of the jaw. On the eighth day he received 1500 units of antitoxin subcutaneously, and the same on the ninth day. On the tenth day the patient had 12,000 units intramuscularly. The trismus was intermittent, coming on when he ate or when he cleaned his teeth. After it had disappeared he had attacks of local rigidity in the leg when it was dressed. No tetanic symptoms after the eighteenth day. Complete recovery.

CASE 9.—Multiple shell wounds, including compound fracture of left tibia and fibula. Antitoxin given same day. Wounds opened up a few days later. Incubation 17 days. Onset with trismus, which was complete in 24 hours. There was no other sign of tetanus. Patient received 8000 units of antitoxin intrathecally on the second, third, and fourth days of the disease and quickly recovered, all trismus having gone in a week. Slight anaphylactic shock occurred after the first intrathecal dose of serum.

CASE 10.—Gunshot wound of right arm. Compound fracture of humerus. Antitoxin same day. Fragments of bone removed on two occasions soon after. Nearly three months later a loose sequestrum was removed with forceps without cutting, and on the following day blood and pus appeared in the urine, lasting for a few days. Previous to the removal of the sequestrum there had been intermittent stiffness of the jaw. Incubation 83 days. Eight days after removal of sequestrum there was marked trismus and slight risus sardonicus. The abdominal muscles were rather rigid, but there was no opisthotonos. Occasional spasms occurred in the wounded arm. On the day of definite onset patient had 24,000 units of antitoxin intrathecally and the same on the following day. On the third day 8000 units intramuscularly and 3000 subcutaneously. On the fourth 8000 and on the fifth 3000, both intramuscularly. A week from onset the tetanus had nearly disappeared and the patient thenceforward steadily recovered.

CASE 11.—Gunshot wound. Compound fracture of right tibia and fibula. Antitoxin two days later and again three weeks later. Two operations in France for setting bones and drainage. Wound healed all but a sinus. Incubation 71 days. Onset preceded for five days by painful pricking sensations in back and over scapulæ. Attack began with spasms in wounded leg and back, with opisthotonos but no trismus. The spasms were painful but not very frequent, and were followed by profuse sweating. Constitutional symptoms slight. No serum treatment was given till the sixth day, when rigidity of the abdominal muscles was present, and the right leg was quite stiff. There was no spasm in the left leg, but increased knee jerk and ankle clonus. On the sixth day patient had an intramuscular injection of 6000 units of antitoxin, and on the seventh day an intrathecal dose of 16,000 units. The opisthotonic spasms ceased after this intrathecal dose. Intramuscular injections of 8000 units were given on the tenth and thirteenth days, and 500 units on the fifteenth day, when the last spasm in the leg occurred. Decreasing rigidity of the abdominal muscles was observed up to the twenty ninth day. Recovery was complete.

Case of Severe Local Tetanus with General Symptoms but no Trismus.

CASE 12.—Multiple shrapnel wounds, apparently slight, but in reality involving fracture of right ilium, with fragment of shrapnel in pelvis. Antitoxin given on following day. Incubation six days or less. Reached England with left leg rigid. The condition was not recognised as tetanus for three weeks; at this time the left leg was rigid throughout, only partially relaxing under general anæsthesia. Twitchings of the right leg were also present, and the whole muscular system seemed to be in a state of increased excitability, all reflexes being exaggerated. Trismus and opisthotonos were absent. On the twenty first day of the disease the patient had an intramuscular injection of 1000 units of antitoxin. On the twenty-second and on the five following days he had intrathecal injections of 8000 units, six such doses in all. The tetanus subsided very gradually, but ultimately quite passed off. The patient, however, became the subject of grave pyæmic complications, with suppurations in joints, and of these he ultimately died some two months after the tetanus had subsided.

Cases of Local Tetanus with Trismus.

CASE 13.—Shrapnel wound, right buttock. Antitoxin given same day. Missile removed in France. Wound healed and patient was walking about ward. Incubation 50 days. As he was walking the right knee suddenly became "locked," and the whole leg was found to be in a state of tonic spasm. On the fourth day the rigidity began to extend to the loins and there was trismus. The affected leg was rigid as a bar of iron, the rigidity being maintained even under deep general anæsthesia. On the fourth day he had two intramuscular doses of antitoxin, each of 1000 units. On the fifth and sixth days intrathecal injections, each of 8000 units. The tetanus passed away very slowly, but recovery was complete.

CASE 14.—Gunshot wound. Compound fracture of right tibia and fibula. Antitoxin given next day. Tibia united and wound nearly healed. Incubation 55 days. Onset with slight trismus. On the fourth day the right leg was stiff, owing to tonic contraction of the hamstrings. There was an erysipelatous condition about the wound, with irregular fever. On the seventh day there was marked trismus, but no opisthotonos. The abdominal muscles were slightly rigid and the right hamstrings were quite rigid. The patient was sweating and had an anxious look. On the sixth day of the disease he had 1500 units of antitoxin subcutaneously in the morning and 3000 or 4000 units intramuscularly in the evening. On the seventh day 3000 units intramuscularly. On the eighth day 16,000 units were given intrathecally and 8000 intramuscularly. After this he had no more spasms and made a good recovery.

Cases of Local Tetanus without Trismus.

CASE 15.—Shell wounds, left thigh and buttock. Antitoxin two days later. Incubation 84 days. Onset with gradually increasing rigidity of left leg to which, in the course of the next month, painful spasms were superadded. Tetanus was not diagnosed till the rigidity had been going on for more than two months and had to some extent involved the abdominal muscles. The patient now received two subcutaneous doses of 3000 units of antitoxin, then 9000 intrathecally, and then 18,000 subcutaneously on three successive days, followed by 18,000 intramuscularly and again 18,000 subcutaneously. This treatment extended over 10 days, with no immediate benefit, but the spasm gradually disappeared in the course of the ensuing three weeks and he recovered.

CASE 16.—Shrapnel wounds of both hands, both legs, and left eye. Wounds healed, and patient was beginning to try to walk. Incubation four months. Onset with stiffness of right leg, developing into tonic spasm of ham-strings and quadriceps. Spasm not painful. No other sign of tetanus. On the fifth day of symptoms he had 1500 units of antitoxin into the theca; this was followed by a slight rigor and headache. On the eighth day he had 500 units subcutaneously. The patient made a complete recovery.

CASE 17.—Shell wounds of left knee and ankle and left elbow. Antitoxin given. Primary amputation through thigh in France. The stump was unsatisfactory, and 130 days after the injury 1½ inches of the femur were removed. Twelve hours after this spasms began in the stump; they were very frequent and painful and much increased when the stump was dressed or manipulated. No other sign of tetanus was present except lively reflexes. On the day after the spasms began the patient had 1500 units of antitoxin subcutaneously and on the following day 27,000 units intrathecally. Twenty-four hours after the intrathecal injection the spasms were much relieved, but they went on, gradually ceasing, for a week. No further symptoms occurred. No tetanus bacilli could be cultivated from the wound.

CASE 18. Gunshot wound of right heel, shattering os calcis. Fifteen days later wound opened up and pieces of boot and sock were removed. Pus found tracking up peroneal tendons. On the day after this operation there was pain in the right heel, and 24 hours later (17 days' incubation) painful cramps began in the right calf. These spasms occurred every three or four minutes, knotting the gastrocnemius. There was no tonic spasm. They continued unchanged and finally spread to the hamstrings. On the sixth day the patient had 1500 units of antitoxin subcutaneously, and on the seventh day 5000 by the intramuscular route. There was no immediate improvement, but the spasms gradually disappeared. The case was later complicated by a dangerous gangrenous cellulitis of the buttock and back, but the patient ultimately recovered.

CASE 19.—No wound. Patient came off duty with swollen feet, and cellulitis arose in the right foot, which was incised. Incubation nine days. Onset with twitching of both feet and calves and also of the facial muscles. There was at first some rigidity of the legs, more in the left than in the right. This soon passed off. No trismus and no other sign of tetanus. On the day of onset 16,000 units of antitoxin were given by the intrathecal route and 8000 by the intramuscular. These doses were repeated on the following day, and later some smaller intramuscular doses were given. In about a week from the onset the symptoms had subsided, the facial twitching being the last to go.

CASE 20.—Trench feet, with slight breach of surface over the left internal malleolus. Twenty-nine days later inflammation set in round the malleolus, and the left sterno-mastoid was found to be rigid and contracted. No spasm in leg and no trismus. As a precaution 1500 units of antitoxin were given intramuscularly on the day of onset, and on the following day the same, with 9000 by the intrathecal route. On the third day the sterno-mastoid was nearly relaxed, but the knee-jerks were much exaggerated. Later the patient had pains in various joints, which improved when active treatment was employed for pyorrhœa alveolaris, from which he suffered.

Comments on the Preceding Cases.

Five patients out of the 20 died, but only 4 died from tetanus. One of these received no serum treatment, and 2 more were men unprotected by a prophylactic dose of antitoxin. Of the 16 cases which received intrathecal injection of antitoxin 2 died from tetanus and 1 later from septic complications. Thus if I wished to claim a low percentage mortality I could do so. The total mortality from tetanus was 20 per cent., and amongst the cases treated by intrathecal antitoxin 12½ per cent. Such figures would, however, be worthless as an argument for the intrathecal route, for the cases were a very mixed series, and 6 of them were cases of local tetanus, in which recovery would probably have ensued whatever the mode of treatment. The last three cases were perhaps not tetanus at all; indeed, Case 20 was so doubtful that antitoxin was only given as a precaution, while the medical officer in charge of Case 18 did not agree that it was one of tetanus. A much closer criticism of the cases is required before forming an opinion as to the value of the intrathecal route.

The impression left upon my mind is as follows. Many of the subjects of the most severe tetanus, especially those who have received no prophylactic injection of antitoxin, will die whatever is done. But I should much like so see the effect of really adequate doses (20,000–30,000 units) intrathecally given at the very onset of such cases. At the other end of the scale are the cases of local tetanus, with very low mortality and a tendency to spontaneous recovery, which cannot be used as an argument in favour of any given route. But between these two extremes lies a group of cases in which efficient treatment may turn the scale, and I think that it is by such cases, of sufficient gravity to threaten life, that a mode of treatment should be judged. I should place at least five of the preceding cases in this category—viz., Cases 5, 6, 9, 10, and 11. Some, it is true, were caught so early that dangerous symptoms had not had time to develop—e.g., Case 9—but even here severe trismus with an incubation of only 17 days is a grave condition. All these cases were treated with large intrathecal doses of antitoxin, though other routes were employed as well in most of them, and all made excellent recoveries. I was particularly struck with the rapid improvement which usually followed the intrathecal dose, the spasms often abating in 24 hours.

It may be said, and I cannot disprove it, that equally good results might have been obtained by similar doses of serum by the intravenous or intramuscular routes. My impression, however, is that the improvement was more rapid and striking in these cases than I have seen recorded in cases treated by other routes. I have in mind also a case which recently occurred in St. Bartholomew's Hospital under the care of Dr. T. J. Horder, and which we hope to publish. A woman with moderately severe tetanus received 24,000 units of antitoxin intravenously on the day of admission to the hospital with no benefit; 48 hours later her condition was dangerous and she was given 27,000 units by the intrathecal route with striking results. Improvement was manifest next day and she made a good recovery.

Anaphylaxis.—Meningeal Reaction.—Route in Local Tetanus.

A further matter cannot be ignored in the choice of a route for antitoxic serum; it is the risk of anaphylactic shock in patients who have received a prophylactic dose of antitoxin. Only one of the 16 patients in my series exhibited shock after the intrathecal injection, and it was not severe. Cases of shock, sometimes severe, have been

reported even after subcutaneous injection of a second dose, but such instances are of considerable rarity. Those who employ the intravenous route probably run greater risks, but it seems true that even here shock is exceptional, and that series of cases of tetanus in men who have previously had serum have been treated intravenously without this accident. Nevertheless, everything that we know about anaphylaxis from the experimental side points to the intravenous as the most certain route for producing shock, except perhaps the intracerebral. There is, further, plenty of clinical evidence that the danger is a real one in man; fatal cases, for instance, have been reported lately from the intravenous injection of antidysenteric serum. This is certainly an argument which is of weight with me in my preference for the intrathecal rather than the intravenous route. We know, too, that antitoxin is readily and quickly absorbed from the theca into the circulation, so that the intrathecal route practically accomplishes in a short time all that can be attained by intravenous injection with less risk of shock and with the possible, but unproven, advantage of some direct action upon the central nervous system.

The risk of sepsis from intrathecal injection is one which, with ordinary care, should be negligible. In hundreds of lumbar punctures at St. Bartholomew's Hospital I have never seen it. It may be simulated in mild degree by the meningeal reaction against a large dose of alien protein; slight symptoms of meningeal irritation are sometimes seen, and the reality of the reaction is manifest from the fact that for a day or two after an intrathecal injection of serum the cerebro-spinal fluid is turbid with polymorphonuclear leucocytes. But this seems to do no harm.

One other question remains to be considered. Is it worth while to employ the intrathecal route in cases of local tetanus? The French authorities seem to consider that it is sufficient in these cases to maintain the existing protection by subcutaneous doses of antitoxin. In established cases of local tetanus with no sign of involvement of the higher centres I should concur in this view, for I have seen no great benefit from intrathecal injection in such cases. Nevertheless, Case 17 in my series suggests that in an early case of this condition intrathecal injection may be of benefit, and whenever trismus comes to be superadded I should regard it as indicated. It must be remembered that an insufficiently treated case of local tetanus tends to pass on into the general disease as protection becomes weaker. Of this a convalescent case from France, which I saw when cured, affords a good example. An artillery officer received a flesh wound in the thigh and had antitoxin six hours later. After some nine weeks, when the wound was perfectly healed, though a fragment of shrapnel remained in it, he noticed a little stiffness of the leg in walking. Nevertheless, his leave up, he returned to duty in France and remained at work for a fortnight till his leg grew so rigid that it was helpless, and he went again into hospital. Trismus, stiff neck, and opisthotonos now supervened and large intrathecal doses of antitoxin were given, supplemented by intramuscular. These were continued for 18 days, by which time he was cured.

I may say, in conclusion, that my object in writing this paper has been to confirm the faith of those who believe in the intrathecal route in face of the doubts which have lately been cast upon its value. In my humble judgment, based, it is true, on a limited experience only, it seems the most potent means of saving life in a disease so terrible that one is justified in running some risks in the attempt to cure. And I believe these risks less, and the prospects of cure greater, or certainly not less, than when the intravenous route is employed, while in the presence of the acuter forms of tetanus the delay involved in absorption from the muscular or subcutaneous tissues means the loss of the precious hours during which life may still possibly be saved.

Note.—Since writing the above I have received from Professor C. S. Sherrington the latest details of his experiments. Of 10 untreated control monkeys all died. Of those treated with antitoxin subcutaneously all died. Of 12 treated by intramuscular injection all died. Of 16 treated by intravenous injection 10 died (62·5 per cent. mortality). Of 18 treated by intrathecal injection 5 died (27·7 per cent. mortality). These figures are more favourable to the intrathecal, as opposed to the intravenous route, than I had supposed.

A CASE OF TETANUS; ISOLATION OF THE BACILLUS FROM A VARICOSE ULCER; TREATMENT BY ANTITOXIN; RECOVERY.

By F. W. ANDREWES and THOMAS J. HORDER.

This case on admission to hospital appeared a suitable one for the intravenous administration of serum; but, as will be seen, recourse was later had to the intrathecal route.

Clinical note of the case.—A married woman, aged 44, was admitted to St. Bartholomew's Hospital on Jan. 15th. On Jan. 10th she felt ill, with headache and slight backache. Next day her jaw was stiff. On the third day of her illness the pains in the back increased and the chest was also painful. She was seen by a doctor on the fifth day and was admitted to hospital on the sixth day. On examination the face was flushed, with slight cyanosis; the patient was drowsy and lay with legs abducted. The temperature was 99·4° F., pulse 110, respirations 20. The jaw was rigid, the incisor teeth opening less than quarter of an inch. There was slight cervical rigidity for antero-posterior movements, but not for lateral movements. There was no retraction of the head. The abdominal muscles were stiff. The legs could not be voluntarily adducted. Examination of the left leg showed an old varicose ulcer, of 18 years standing, just above the inner malleolus. The ulceration was very superficial and about 3 by 2 inches in extent. It was covered by very pale and fine granulations. The surrounding skin was pigmented but not inflamed. There was no œdema, no cellulitis and no enlarged glands. On the seventh day of the disease the patient became much worse; the drowsiness increased, the temperature rose to 101°, pulse to 120, and respirations to 30, the cyanosis increased; more serious than these, spasms began early on this day, at first infrequent and mild, but later very frequent and severe. On the evening of the eighth day the temperature reached 102·2°, pulse 128, respirations 42; the patient was unconscious for the most part, with retention of urine. On this day the first intrathecal injection of antitoxin was given. On the ninth and tenth days the patient's general condition was better, and the spasms were no worse. On the eleventh day the second intrathecal injection of antitoxin was given. Gradual progress took place thence onwards. The temperature fell gradually and reached normal on the sixteenth day. The trismus began to relax on the eighteenth day and was almost absent on the thirtieth. The patient got up on the thirty-fifth day, and left hospital quite well on the forty-ninth day.

Serum treatment.—The disease was well generalised, not, at the time, of very great severity, and the patient had not previously received any dose of serum which would have rendered her sensitive. She was therefore given 24,000 units of a potent serum from the Lister Institute, of the value of 8000 U.S.A. units in 10 c.c. which had been placed at the disposal of one of us (F. W. A.) by the kindness of Dr. MacConkey, and which had previously given good results on intrathecal administration in several cases. The effect of this was disappointing, and the patient fell into such a dangerous condition that, two days later, the intrathecal route was adopted. Dr. O'Brien, of Messrs. Burroughs and Wellcome's laboratories, had kindly given one of us (F. W. A.) for trial some concentrated antitetanus serum prepared in the usual way by ammonium sulphate precipitation of the globulin fraction and re-solution. It contained double the ordinary amount of protein, and had a value of 27,000 U.S.A. units in 12 c.c.

The cerebro-spinal fluid.—Of the specimen removed at the time of the first intrathecal injection Dr. Stansfeld reported as follows: The fluid is quite clear and colourless, the cells present are not increased in number, the protein is in very small amount (too small for estimation), and the reducing power is normal. Of the specimen removed at the time of the second intrathecal injection, three days after the first, Dr. Canti reported as follows: Quantity, about 15 c.c.; colourless; fine flakes present; no admixture of blood; cells, 470 per c.mm.; lymphocytes, 10 per cent.; polymorphs, 86 per cent.; endothelium, 4 per cent.; the protein amounted to 0·025 per cent., and globulin was present; Fehling's reduction normal; sterile in film and culture. This report illustrates the well-known phenomenon of mild meningeal irritation with polymorphonuclear leucocytosis following the injection of alien serum into the intact subarachnoid space. It is apparently devoid of serious import.

Bacteriology.—The ulcer was examined by one of us (F. W. A.) the day after admission. In stained films the predominating organism was a staphylococcus, but many long thin bacilli were present which would have passed as tetanus though no sporing forms were seen. Anaerobic meat-broth tubes under liquid paraffin were inoculated with the secretion, and yielded an abundant growth of *B. tetani*, from which the staphylococci were later eliminated by heating. The toxicity of the culture was marked; mice inoculated with 1/1000 and 1/2000 c.c. developed intense tetanus in 24 hours; smaller doses were not tried. The heated cultures were not pure tetanus; in a subculture given to the Lister Institute the malignant œdema bacillus was also found present by the workers there. Eleven days after the patient's admission to hospital the ulcer was examined again. With the rest in bed it had completely healed, and was covered with a thin layer of new epidermis. Nevertheless, a swab rubbed over the cleansed surface, at the point where the healing appeared most recent, yielded a culture of *B. tetani* as abundant as the first. The site of the ulcer was now dressed daily with a paste of "eupad"; after a week of this treatment no more tetanus bacilli could be cultivated.

General comments.—There was no trauma in this case, nor was there any suggestion as to the manner in which the varicose ulcer became infected, nor how long it had been infected. This particular channel for infection is probably very unusual, and worthy of record. But a more important reason for referring to the case is that in it the effect of a single intrathecal dose of 27,000 units of antitoxin on the eighth day of the disease was so marked that it is difficult to believe it due to anything but the change of route. It is true that a different brand of serum was used for this intrathecal injection from that used intravenously 48 hours earlier. But both brands had been used by one of us (F. W. A.) in several cases, and there was no reason for supposing the one serum better than the other. It is, of course, just possible, though not probable, that the good results following so quickly upon the intrathecal dose were a delayed effect of the intravenous dose. The second intrathecal dose was given as a precaution and not from any urgent necessities of the case.

A COMPARISON OF SUBCUTANEOUS WITH INTRAVENOUS AND INTRATHECAL ADMINISTRATION OF TETANUS ANTITOXIN IN EXPERIMENTAL TETANUS.

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THE War Office Committee for the Study of Tetanus has, in a memorandum, emphasised the advantages of serum treatment in tetanus by the intrathecal method.

With a view of testing in animals the relative efficiency of the administration of antitoxin by the subcutaneous, the intravenous, and intrathecal methods in tetanus, a series of experiments has been made on cats and on rabbits injected with equivalent doses of tetanus toxin.

The results obtained show the indubitable superiority of the intravenous and intrathecal routes over the subcutaneous. Such superiority may be attributed to the slow absorption of tetanus antitoxin injected subcutaneously.

It will be seen by reference to Table III. that even when injected 24 hours later, antitoxin by the intrathecal route is more efficient than the subcutaneous injection.

None of the results gave any encouragement to the view that toxin may be neutralised once it has entered the nervous system. The whole problem of the serum therapy of tetanus appears to be that of cutting off fresh supply of toxin by bringing antitoxin into relation with the focus of infection as rapidly as possible. In animals with a high resistance to tetanus, such as cats and rabbits, the symptoms develop comparatively slowly; in the susceptible guinea-pig the development is much more rapid even if we make allowance for the shorter nerve path traversed by the toxin to reach the central nervous system. Man is much more akin to the guinea-pig in susceptibility, and in the unprotected subject symptoms may develop from a local spasm to generalised tetanus with startling rapidity. The greater swiftness with which antitoxin can be brought into action by intrathecal and by intravenous administration rather than by subcutaneous should therefore be of paramount importance in treatment. This fact has been to some extent obscured during the present war owing to prophylactic administration of serum having converted man from a susceptible to a resistant organism, and this is evidenced by the occurrence in the majority of cases of a clinical picture of tetanus which had previously been very rare in the human subject, though it is the rule in highly resistant animals such as the cat and the rabbit. The disease first manifests itself in local spasms of the muscles supplied by the spinal segments directly in nervous continuity with the wound. It may either remain localised or more or less slowly invade the whole nervous system. In such cases the better results obtained by intravenous and by intrathecal administration are not always so apparent, but since it is impossible to say whether or not a sudden rapid invasion of the whole central nervous system may develop, it would appear to be courting needless risks to delay the bringing into action of antitoxin by adopting the subcutaneous method.

The appended series of four experiments illustrate the points referred to above.

COMPARISONS OF SUBCUTANEOUS WITH INTRATHECAL INJECTIONS OF ANTITETANIC SERUM BEFORE ONSET OF TETANIC SYMPTOMS.

EXPERIMENT 1.—*Four Rabbits received Injection of Tetanus Toxin 160 + ms. per g. in Left Gastrocnemius. No Tetanus within 24 hours. Each Rabbit received 75 U.S.A. Units of Antitoxin per kg. 24 hours after Toxin.*

No. of rabbit.	Site of injection of antitetanic serum.	Result.
128	Subcutaneous.	48 hours after toxin marked rigidity of left leg. Died of general tetanus on fourth day.
129	Intrathecal.	48 hours after toxin slight rigidity of left leg. Passed off after three days. Recovered.
130	Subcutaneous.	48 hours after toxin marked rigidity of left leg. 12 hours later left anterior extremity affected. Rigidity of left leg lasted one month. Recovered.
131	Intrathecal.	48 hours after toxin slight rigidity of left leg. Recovered completely in three days.

EXPERIMENT 2.—*Three Cats received Injection of Tetanus Toxin 40 + ms. per g. in Left Gastrocnemius. No Tetanus within 24 hours. Two Cats received 75 U.S.A. units of Antitoxin per kg. 24 hours after Toxin.*

No. of cat.	Site of injection of antitoxin.	Result.
104	Subcutaneous.	Marked rigidity of left leg. Lasted till killed a week later.
105	Intrathecal.	Slight weakness of left leg. Passed off in three days. Recovered.
106	No injection.	Marked rigidity of left leg. Anterior left extremity also affected. Lasted till killed a week later.

COMPARISON OF SUBCUTANEOUS WITH INTRATHECAL INJECTION OF ANTITOXIN BEFORE AND AFTER THE ONSET OF TETANIC SYMPTOMS.

EXPERIMENT 3.—*Ten Rabbits received Injection of + 160 ms. per g. Toxin in Left Gastrocnemius.*

Time after toxin.	State at time of injection of antitoxin.	Subcutaneous injection of 100 U.S.A. units antitoxin.	Intrathecal injection of 100 U.S.A. units antitoxin.
24 hours	No local tetanus.	No. 144 developed marked rigidity 40 hours after toxin. Died fourth day.	No. 147 slight rigidity 36 hours after toxin. Recovered four days.
36 ,,	Slight local spasm.	Nos. 145 and 146 rigidity increased. Died fourth day.	Nos. 148 and 150 rigidity increased; forelimbs affected next day. 148 recovered. 150 died sixth day.
48 ,,	Marked local spasm of left leg and weakness of anterior extremities.	Nos. 149 and 151. Died fourth day.	Nos. 152 and 153 no amelioration of symptoms. Died fifth and sixth days.

INTRAVENOUS INJECTION OF ANTITOXIN COMPARED WITH SUBCUTANEOUS AND INTRATHECAL INJECTIONS.

EXPERIMENT 4.—*12 Rabbits received Injection of 100 + ms. per g. Toxin in Left Gastrocnemius.*

Time after toxin of antitoxin injection and state of rabbit.	Subcutaneous injection 100 U.S.A. units.	Intravenous injection 100 U.S.A. units.	Intrathecal injection 100 U.S.A. units.
24 hours. No tetanic symptoms.	A. and B.: Rigidity (local) 36 hours after toxin. Died third day.	C. and D.: Slight local rigidity 36 hours after toxin. Well-marked rigidity of left leg 12 hours later. Forelimbs not affected. Recovered.	E. and F.: Slight rigidity left leg 36 hours after toxin. No increase of symptoms. Recovered.
48 hours. Well-marked rigidity of left leg.	G. and H.: Anterior extremities affected 60 hours after toxin. Died third day.	J. and K.: Rigidity remained localised to left leg. Recovered.	L. and M.: Next day L. showed paresis of both forelimbs. Died fifth day. M. slight rigidity of left forelimb and paresis of right next day. Recovered.

A STATISTICAL NOTE ON AN ANALYSIS OF CASES OF TETANUS IN THE BRITISH EXPEDITIONARY FORCE.

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IN THE LANCET of Jan. 27th (pp. 131 *et seq.*) Colonel Sir William Leishman and Major A. B. Smallman published an analysis of the cases of tetanus, 157 in number (neglecting three cases respecting which no details were given), which had occurred in hospitals in France between July 1st and Oct. 31st, 1916. These authors, while fully admitting the fragmentary character of their material, felt justified in enunciating a few practical conclusions. They held that the results threw "very considerable doubt upon the advisability of employing the intrathecal route, either alone or in combination, and, further, they seem to indicate considerable virtue in connexion with the employment of the subcutaneous and intramuscular channels, particularly the latter." In a summary of conclusions (ibid., p. 137) this judgment is reiterated, the evidence available with respect to the intrathecal method being described as "pretty strongly against its employment." Colonel Leishman and Major Smallman adduce certain theoretical and technical considerations in support of their condemnation of the intrathecal route, but their chief argument is founded upon the results of statistical tabulation, in particular upon the fact that while of 111 patients treated wholly *or in part* by the intrathecal method, 84 (76 per cent.) died; of 32 patients treated wholly *or in part* by the intramuscular route, only 19 (59 per cent.) succumbed.

Analysis of Statistical Results.

The fundamental data appear in Colonel Leishman and Major Smallman's Table VII. (here reproduced, with some additions, as Table I.), which records the numbers of deaths

TABLE I.—*Fatalities in Different Groups. Observed by Leishman and Smallman.*

T, Intrathecal; V, Intravenous; S, Subcutaneous; M, Intramuscular. The figures in brackets are the "expected" deaths deduced from the mean rate of fatality.

Method of administration.	No. of cases.	No. of deaths.	Fatality per cent.	Method of administration.	No. of cases.	No. of deaths.	Fatality per cent.
T	25	21 (18·31)	84	S M	1	1 (0·73)	100
V	7	7 (5·13)	100	T V S	20	17 (14·65)	85
S	27	15 (19·78)	55	T S M	4	1 (2·93)	25
M	4	3 (2·93)	75	T V M	5	3 (3·66)	60
T V	14	11 (10·26)	78	V S M	1	1 (0·73)	100
T S	28	21 (20·51)	75	T V S M	2	1 (1·47)	50
T M	13	9 (9·52)	69				
V S	4	4 (2·93)	100				
V M	2	0 (1·47)	0	Totals ..	157	115	—

and recoveries distributed in 15 sub-groups, each sub-group being composed of individuals treated by a different method or different combination of methods. The authors comment on this table in the following words:—

The uneven size of the groups and their very number make evident the futility of any attempt to form conclusions from a consideration of the degree to which the case mortalities are above or below the mean rate of the whole 157 cases.

I cannot concur with Colonel Leishman and Major Smallman in this reasoning, which, if correct, would force us to abandon the application of statistical methods to all frequency systems except those in which the sub-group frequencies are sensibly equal. On the contrary, I think an analysis of this table should be the first stage of the inquiry. What we seek to learn in the first instance is whether the variations in the case mortalities of these 15 groups are greater than might reasonably be attributed to the operation of pure chance, to the fluctuations which occur among small groups of individuals taken at random from a population experiencing a rate of loss identical with the mean rate—viz., 73·2 per cent. Clearly if the fluctuations are not greater than might often occur in this way, we cannot expect to derive any useful information as to which of the 15 methods, or combinations of methods, is the best to employ in future.

Two methods can be used to answer this fundamental question.

The first is to divide the difference between the number of deaths actually observed in each group and the number expected (on the assumption that the mean rate applies to all alike) by the latter's standard deviation and then to ascertain whether the resulting 15 reduced deviations are effectively distributed in accordance with the normal curve of errors.

The second method is to form a table with 30 compartments, corresponding to the complete distribution of the individual records, and then to compute the value of the function X^2 for the whole table. Thus, the chance that an individual observation which falls into the group T will fall also into that of recoveries is $25/157 \times 42/157$, and the number of such observations will be 157 times this—i.e., 6·69—and a similar calculation gives us the remaining *a priori* values.

If the difference between this "expected" value and the observed value be squared and the square divided by the "expected" value, the sum of the resultant numbers will measure the divergence between the calculated and observed result and, from published tables, the probability of such a divergence having arisen by chance can be computed.

Theoretical objections can be urged against either method; with greater force perhaps against the former owing to the small size of several of the groups and the consequently hazardous assumption that the distribution is normal. They are, however, sufficiently accurate for our present purpose. Taking the first method, we have the results shown in Tables II. and III. The agreement between observation and

TABLE II.

Group.	Difference between observed and expected deaths.	Standard deviation of expected deaths.	Difference divided by standard deviation.	Group.	Difference between observed and expected deaths.	Standard deviation of expected deaths.	Difference divided by standard deviation.
T	+ 2·690	2·213	+ 1·216	V M	− 1·465	0·626	− 2·340
V	+ 1·873	1·171	+ 1·599	S M	+ 0·267	0·443	+ 0·603
S	− 4·778	2·300	− 2·077	T V S	+ 2·350	1·980	+ 1·187
M	+ 0·070	0·885	+ 0·079	T S M	− 1·930	0·886	− 2·178
T V	+ 0·745	1·656	+ 0·450	T V M	− 0·663	0·990	− 0·670
T S	+ 0·490	2·342	+ 0·209	V S M	+ 0·267	0·443	+ 0·603
T M	− 0·523	1·596	− 0·328	T V S M	− 0·465	0·626	− 0·743
V S	+ 1·070	0·885	+ 1·209				

TABLE III.

Deviation.	Observed.	Expected.
Greater than + 1 S.D.	4	2·38
0 — + 1 S.D.	5	5·12
− 1 S.D. — 0.	3	5·12
Greater than — 1 S.D.	3	2·38

expectation is such that were the assumption really correct we should expect on repeating the experiment to find, on the average, no better agreement in 55 per cent. of our trials.

Passing to the second test, we have $X^2 = 23·5375$, which corresponds to $P = 0·751$, or odds of three to one that in the long run we should get as bad a result, or a worse result, as the experiment actually shows. Consequently either path leads us to the same conclusion—viz., that the variations of case mortality from group to group are such as might easily arise by chance within a uniform population. A corollary is that we cannot properly draw any conclusion at all as to which method of administering the antitoxin is practically the best. In view of the results just detailed, it is hardly necessary to carry the investigation further, but a few remarks on Colonel Leishman and Major Smallman's subsequent tabulations are permissible.

Difficulty arising from Scantiness of Data.

These investigators being sensible that the numbers of cases treated solely by one or other of the methods they desire to contrast—viz., intrathecal and intramuscular—were too scanty to warrant definite conclusions, sought to overcome the difficulty by widening the groups. This they have done by contrasting all the groups in which intrathecal injections formed a portion of the treatment with all those in which intramuscular injections were employed.

The result is that 24 out of the 32 cases forming the combined M group, 75 per cent. of the total for that group, also figure in the combined T group with which it is contrasted. It is to be feared that an initial scantiness of data cannot be remedied by so simple an expedient. If we desire to contrast the pharmacological actions of two drugs and have small numbers of observations relating to the separate action of each drug, the addition to each homogeneous group of a heterogeneous set of observations involving the action of both drugs can only blur the difference without in any way increasing the reliability of the original experiments; obviously the larger the heterogeneous group added in, the nearer must the mean of each aggregate approach to that of the heterogeneous group. If we suffer from a shortage of potatoes, we shall remain short of potatoes no matter how many pigs fattened on potato parings may be brought to market. I think, therefore, that the comparison must be restricted to that of groups involving T but not M with those involving M but not T. In the former category we have 87 cases with 70 deaths, in the latter 8 cases with 5 deaths.

The usual method of comparing these results is to take as the probable rate of mortality for both groups $\frac{70+5}{87+8}$ and contrast the observed difference between the two rates with the probable error of the difference. We have: Actual difference, 0·1796; standard deviation, 0·1506; probable error, 0·1016. Assuming the distribution of errors to be normal, we should expect to get a deviation of this magnitude, positive or negative, or greater, once in 4·3 trials.

Another method is to inquire what the chance may be that after 70 deaths have occurred in 87 cases a second sample of 8 would provide 5 or fewer deaths, it being assumed that we have no knowledge of the "real" case mortality other than that furnished by the samples themselves. Making the necessary calculations,[1] we find that the chance is 0·2148, or the event such as will occur on the average once in every 4·7 trials.

Neither test raises any serious presumption that the T group differs from the M group to a degree inconsistent with the belief that the result is a mere chance variation. I conclude, therefore, that Colonel Leishman and Major Smallman's statistics are altogether inadequate to support any argument in favour of or against one or other method of treatment. Pending the collection and analysis of fuller statistics, the clinician must decide what course to adopt upon other than statistical considerations.

NOTE ON A BACILLUS RESEMBLING *B. TETANI*.

BY R. S. ADAMSON, M.A. CANTAB., B.S. EDIN.,
AND
D. W. CUTLER, M.A. CANTAB., B.SC. LOND.
FROM THE DEPARTMENT OF PATHOLOGY, UNIVERSITY OF MANCHESTER.

(*Report to the Medical Research Committee.*)

IN the course of the bacteriological examination of cases of septic and gangrenous wounds in patients in the 2nd Western General Hospital we have noticed on nine occasions in films, and have four times isolated, once from a blood culture taken after the death of the patient, an anaerobic bacillus closely resembling in appearance the *Bacillus tetani*. Two of the four patients from whom the bacillus was isolated had developed tetanus. As the organism does not seem to be generally known it seemed advisable to publish a preliminary note on the subject, pending further studies which we hope to publish shortly.

The bacillus is a strict anaerobe and does not grow in the presence of oxygen. We have always grown our cultures in a Bulloch's chamber at 37° C. The bacillus is characterised by the production of large terminal spores which are quite round. The body of the bacillus is large, the average length being between 6 and 7μ, though occasionally individuals as long as 12μ have been seen. In width it is more constant, varying between 1 and 2μ, but generally between 1 and 1·5μ. These measurements do not include the terminal spore. The spore itself is quite round and varies from 1·7μ to 2·2μ in diameter, the normal size being about 1·8μ. These measurements are considerably greater than those of the true *B. tetani*, which measures in length 2–4μ and in width 0·3 to 0·5μ, according to Lingelsheim, who gives 1μ to 1·5μ as the spore width.

The bacillus is motile, but the movement is never rapid and quickly disappears in the presence of air. Old cultures do not show any motility. On glucose-agar plates incubated for five to seven days the bacillus produces rather large colonies, whitish or pale grey in colour, and of a moist consistency. These colonies are usually circular and regular in outline with a raised centre. On very moist plates the organism may produce a transparent dendritic growth, appearing as fine branching lines radiating from a centre. The bacillus grows well on agar and glucose-agar; on Dorset's egg medium it produces a quite superficial growth, the colonies being circular and white, but no digestion or discolouration of the medium takes place. Growth on inspissated serum is very poor, and the organism fails to grow freely in ordinary broth, though it grows well in glucose-broth. In deep stab cultures in glucose-agar a moderately free growth occurs along the needle track, but does not produce threads radiating into the medium. Little or no gas is produced.

On Hiss's serum-water sugars the reactions are constant and characteristic. The organism ferments glucose, lactose, and maltose with the production of a slight amount of acidity, but no clotting of the serum or gas production. Cane sugar and mannite are not changed. In litmus milk distinct acidity is produced without clotting, and a slight degree of peptonisation occurs. Peptonisation, however, does not proceed far, and there is no separation of the medium into layers which is so marked a feature of *B. œdematis maligni*. Gelatin is not liquefied and no indol is produced in broth cultures.

The bacillus is Gram-negative, though young cultures, especially in broth, may be Gram-positive. Commonly, however, the bacillus exhibits irregular staining reactions having Gram-positive spots or bands on a Gram-negative background. These spots, however, do not seem to have any constant position. Young spores appear to retain the stain by Gram's method. The bacilli are generally isolated, though chains of two to four or six individuals may occur. They have rounded ends, though one or both ends may appear tapering. Spores are freely produced on all media and seem always terminal in position.

As the result of preliminary experiments kindly carried out for us by Professor H. R. Dean, the organism does not seem pathogenic to guinea-pigs or rabbits in pure culture or in mixed cultures with this bacillus as the predominant form. Inoculations of pure or mixed cultures into guinea-pigs have failed to produce any symptoms suggesting tetanus.

Other authors have described anaerobic bacilli with round terminal spores resembling *B. tetani*, as, for instance—

San Felice's Anaerobe IX. (1893) or *Pseudobacillus of tetanus*. This organism is described as liquefying gelatin, and the photographic figures of the colonies do not at all resemble those produced by our organism. San Felice considers his organism to be a non-toxic strain of *B. tetani*.

Tavel (1898) has described an anaerobic bacillus which he isolated from abscesses and inflammatory conditions of the intestine and appendix, which he calls a *pseudotetanus bacillus*. He describes it as a long and slender bacillus easily distinguished from the true *B. tetani* on account of the fact that the terminal spore is oval and not round. This is a quite different organism, and in its form and cultural characters which he describes seems to resemble the Hibler IX. bacillus more than any other.

The *Bacillus putrificus* of Bienstock has been described as resembling that of tetanus in appearance, but its cultural reactions according to Macé and Muriel Robertson seem closer to those of *B. œdematis maligni* than to any other organism. Further the latter author describes the bacillus as having oval spores.

Owing to the well-known difficulty of isolating *B. tetani* in pure culture and to the ease with which our organism may be confused with it in mixed cultures or pus films, a summary of some of the main differences is given.

This organism is considerably larger and broader than *B. tetani*, also characteristically Gram-negative. This feature, however, may be overlooked owing to the irregular staining mentioned above.

The reactions of *B. tetani* on carbohydrate media do not seem to have received much attention. Macé says that there is no production of acid on glucose, and this is confirmed by the observations made by Dean and Mouat (1916) on a single strain. Lingelsheim and also Robertson say that in milk casein is precipitated and digested. The latter author also states that meat is blackened, with the production of a putrid odour; our organism does not react on the medium in

[1] Pearson, Phil. Mag., 1907, p. 365; Greenwood, Biometrika, 1913, x., p. 69.

this way. These authors also state that *B. tetani* liquefies gelatin, which does not occur with our organism.

Differences in colonies, though never of any great value, are well marked between the two organisms. The wavy outline of the *B. tetani* colonies is not seen, nor does our organism produce the branching and rounded processes in streak cultures. The branches we have described as "dendritic" are not characteristic, and when produced are fine and thread-like and almost completely transparent.

Finally, a very marked difference between the two is the apparently complete absence of toxin production.

Conclusions.—We regard the bacillus which we have described as a member of the large group of intestinal anaerobic bacteria which includes not only *B. tetani*, *B. œdematis maligni*, and *B. aerogenes capsulatus*, but also in all probability a large number of other as yet imperfectly differentiated varieties.

The microscopical and cultural characterictics appear to differ in important particulars from the already described members of the group. The microscopical appearances, indeed, closely resemble those of *B. tetani*, for the spore is round and absolutely terminal, and the possibility occurred to us that we might be dealing with atoxic strains of the tetanus bacillus. We are, however, at present inclined to the view that we are dealing with a distinct variety of bacillus, for not only did all four strains fail to produce toxin but their cultural characteristics on the media above described differed in essential details from those of *B. tetani*.

The injection of pure cultures failed to produce any effect in rabbits and guinea-pigs; a result which does not necessarily imply that this bacillus is incapable of taking part in the production of morbid changes in a septic wound. It is well known that pure cultures of *B. œdematis maligni*, *B. tetani*, and other members of the group may fail to produce any lesion after experimental inoculation. Investigations on this point are in progress, but the microscopical appearances of this bacillus so closely resemble those of *B. tetani* that we have thought it desirable to publish a short preliminary note. It is obvious that the occurrence of this bacillus in septic wounds adds considerably to the difficulty of diagnosis of tetanus by purely microscopical methods.

In conclusion, we desire to express our thanks to Professor Dean, under whose direction the investigations have been carried out.

References.—Dean, H. R., and Mouat, T. B.: The Bacteria of Gangrenous Wounds, Journal of Royal Army Medical Corps, February and March, 1916.

Lingelsheim: Tetanus; in Kolle und Wassermann, Handbuch der pathogenen Mikroorganismen, second edition, 1912, iv. Jena.

Macé, E.: Traité pratique de Bactériologie, sixth edition, 1913, ii. Paris.

Robertson, Muriel: Notes upon Certain Anaerobes Isolated from Wounds. Journ. of Path. and Bact., 1916, xx.

San Felice, F.: Untersuchungen über anaerobe Mikroorganismen, Zeitschr. für Hygiene und Infectionskrankheiten, 1893, xiv.

Tavel, E: Ueber den Pseudotetanusbacillus des Darmes, Centralblatt für Bakteriologie, 1898, xxiii.

A CASE OF TETANUS TREATED BY INTRATHECAL AND INTRAMUSCULAR INJECTION OF ANTITOXIN.

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THE interesting features of the case here described are the success of the combined intrathecal and intramuscular injections and the use of the high dorsal injection, the arm being the principal site of spasm.

W. M., aged 32, was hit by shrapnel on Sept. 18th, 1916, receiving multiple superficial wounds on both hands and the left thigh. He was dressed at once, and a few hours later a piece of shrapnel was removed from his right hand. He does not remember receiving any prophylactic injection of antitetanic serum. He reached this hospital on Sept. 23rd, where his wounds were treated by saline fomentations and baths. On Oct. 2nd, at 4 A.M., he noticed that his jaws were stiff so that he could not open his mouth, and an hour later he began to have violent and painful cramps in the right arm, in which he had not previously noticed any symptoms. Seen at 10 A.M. on that day his temperature was 99·6° F. and his pulse 130; he was sweating profusely and had great pain in the right arm. The small superficial wound on the left thigh was granulating, but still discharging a little pus; the wounds of the left hand were dry and healing under scabs; on the right hand were multiple, small, superficial wounds, some healing under scabs, some discharging a little pus. The right arm was flexed at the elbow and wrist, the fingers partially flexed at the metacarpo-phalangeal and extended at the interphalangeal joints. The flexor muscles of wrist and fingers were in a state of tonic contraction and violent spasms were occurring at intervals of about five minutes. The patient was holding the fingers of the right hand with his left to prevent flexion, and whenever he released them violent spasms occurred. The masseters were tense and the posterior neck muscles were stiff. The left arm was not stiff, but the triceps-jerk was exaggerated. Knee-jerks and plantar reflexes were exaggerated, especially on the right side.

At 10 30 A.M., under anæsthesia, 5000 units of antitoxin were injected into the spinal theca in the lumbar region and 10,000 units were given intramuscularly. At 6 P.M. the patient was worse, the spasms occurring every two minutes. In view of the fact that the spasms were most marked in the muscles innervated by the nerve cells of the cervical enlargement, it was decided to inject the serum at a high level. Accordingly, on Oct. 3rd a needle was inserted between the first and second dorsal vertebræ; cerebro-spinal fluid was withdrawn,[1] and 4500 units of serum were injected. On Oct. 4th 5000 units were injected intramuscularly. On Oct. 5th the patient began to improve, and on this and two succeeding days 4500 units were given intramuscularly. On the 8th a generalised antitoxin rash developed and the patient seemed much worse; 4500 units were injected into the subarachnoid space between the first and second dorsal vertebræ. On the 9th the patient was much better again and afterwards progressed well, the spasm very gradually passing off from the masseters and the arm muscles. On the 14th 4500 units were injected intramuscularly.

The patient was discharged to convalescent hospital on Nov. 6th.

Reviews and Notices of Books.

Makers of the XIXth Century: Herbert Spencer. By HUGH ELLIOT. London: Constable and Co., Limited. 1917. Pp. 330. Price 6*s*.

THIS is an excellent estimate of Herbert Spencer's life-work, made piquant by the personal attitude of the author towards that work. Mr. Elliot says in his introductory chapter that it has been his fortune to read through the whole of Spencer's works twice at an interval of 15 years, and each time during the progress of a great war. His first reading began when on active service in South Africa, when he found Spencer's doctrine of social freedom irresistibly attractive. During the progress of the present war he again read Spencer's furious declamation against warlike and military activities and found in many parts the arguments to be ill-founded, in other parts the conclusions to be false, while the style which formerly appeared to him so lucid now seemed hopelessly monotonous. Starting with this frank revelation of his estimate of Spencer as a guide and an informer, it is a great accomplishment on Mr. Elliot's part to make us see that though his views of Spencer, even in their most depreciatory sense, are just, yet his subject was none the less a powerful instrument for good in the civilisation of the world. No one can read this life of Herbert Spencer without feeling that the philosopher's central teachings concerning the evils of war and the dangers of military dictatorship were and are sound, and that although his social scheme was impracticable when he devised it, his arguments for its development are magnificently conceived and lucidly advanced. Much of his teaching has, indeed, passed into such common acceptance as to be disregarded as platitudes in modern discussions, and there are many writers and speakers to-day who rest their claims for this or that reform upon evidence which was marshalled originally by Spencer, and which in the course of half a century has become part and parcel of the general mental equipment. These things Mr. Elliot brings out forcibly.

Herbert Spencer's life, though barren of interesting happenings in the ordinary sense of those words, was a far more singular one than that of many men of action or of

[1] The cerebro-spinal fluid withdrawn from the dorsal region 24 hours after the injection of 5000 units into the lumbar region was found to contain antitoxin. Details of this observation are given in a paper on "Twenty-five Cases of Tetanus," by Professor H. R. Dean, which is published in the present issue of THE LANCET.

letters. Our statesmen and warriors, for the most part, have shone in the spheres for which they have been prepared or in which they have been able to acquire personal influence and prestige; and, despite notable exceptions, our great writers have usually been endowed early with the training necessary for them if they are to acquire learning before imparting it. Spencer's education may have been thorough, but it was meagre, and ceased when he was a lad; determined to lay down general laws for the proper conduct of life in a most detailed and comprehensive sense of the word, he touched real experience at but few points personally, and those were uninspiring; he had little acquaintance with the great literatures of the past and present upon which to draw for the analogies that might have helped him, or by which he could have corrected or reinforced his views; he never enjoyed any position of academic authority. Yet he became the most widely-read author on sociology that this country has ever produced, and, indeed, through his writings was the first to make the world take a thorough and candid inspection of itself. Even to-day, when that world is furiously engaged in demonstrating the utter impossibility of attempting much towards the carrying out of Spencerian doctrines, Spencer has the laugh on his side, inasmuch as had those doctrines become the inspiration of national politics when he uttered them the war would not have been fought. The man who did these things had an amazing life despite its apparent drabness.

Mr. Elliot's book is in the main an epitome of Spencer's works and theories, and it is so ably done that he may have wrought Spencer the disservice of introducing him to an audience which will find that, having assimilated the essence of the teachings, there is no need to attempt the digestion of the mass. Mr. Elliot's warning is clear here. "If," he says in his concluding chapter, "we Spencerians have imbibed the true feelings of liberty and reason, we shall be the first and not the last to criticise the dogmatic theories of Spencer. And we shall believe that there is still no finer introduction to the sciences of biology, of psychology, of sociology, and of ethics than is to be found in Spencer's monumental works on these subjects." We consider ourselves that no one should attempt to write on sociology generally, or to lay down plans for the better development of the world, without having mastered Spencer's fundamental theories. He aimed at establishing a fundamental distinction between two main types of developed society, these being the much governed, where for military necessity it is necessary that the activities of individuals should be subordinated to the needs of the State, and the loose organisation where social evolution follows industrial and commercial directions; the history of the world as it is now being written confirms much of what Spencer argued in arriving at this classification. Similarly Spencer's views on education, though they are not consistent, should certainly be read at their source. His little book on education is, as Mr. Elliot says, the foundation of all the so-called "modern" ideas in education, while his opposition to a scheme of national education strikes us to-day as hopelessly reactionary, even though some of his warnings against the great expectations of the education reformers have been amply justified. This is made the subject of a brief but interesting discussion by Mr. Elliot, who, however, has not made clear throughout the chapter when he is speaking himself, and when he is reproducing the words or ideas of Spencer.

This interesting book establishes the undeniable claim of Herbert Spencer, under a cloud as his fame now is, to be ranked among the "Makers of the XIXth Century." That he was unsound in his treatment of the forces of heredity, and illogical in his metaphysical meanderings cannot alter the fact that he devised, unaided save in mechanical directions, a system of philosophy which swayed the intelligences of his generation, wrote a brilliantly original work on psychology, and, to quote his biographer, "established the Science of Sociology in England." Those who are tempted now to make or renew acquaintance with Spencer's works will find Mr. Elliot's book, and its bibliographical and chronological information, an invaluable introduction. Their time will not be wasted. When the nations turn, after the upheaval of furious and almost universal war, to undertake the task of repair, and when lines of reconstruction are being sought which may ensure the world against a recurrence of the tragedies now under enactment, in Spencer's ideals there will be found much assistance and encouragement.

Il Nuovo Metodo Italiano per la Cura Antirabbica. By Professor CLAUDIO FERMI, Superintendent of the Institute of Hygiene of the University of Sassari. Rome: Via Sistina 14. 1916. Pp. 164. Price 3 lire.

THE object of this little work is to describe the author's method of treating rabies and to point out its advantages over the vaccines of Pasteur, Calmette, Babes and others, and this the author seems to have done with considerable success owing to the vast number of experimental researches undertaken by him, while the proof of its efficacy is to be found in its extensive adoption in India. Fermi's vaccine consists of an emulsion of 5 per cent. of a powerful virus from rabbit or dog, carbolised to 1 per cent. Pasteur and Calmette both used the medulla, but Fermi uses the cortical brain matter. Antirabic serum is obtained from the horse by using this vaccine as antigen, and the serum vaccine used by him is a mixture of 1 part serum and 2 of vaccine with 1 per cent. phenol. In treatment the patient receives during 5 to 10 days two daily injections of 3 c.c. of this serum vaccine, then for another 15 or 20 days two daily injections of 3 c.c. of vaccine alone are given. The treatment can be carried out at the patients' homes, as both the serum and vaccine, since they remain active for one to two months, can be put up in ampoules and sent for long distances. The object of injecting serum as well as vaccine at first is to introduce into the patient as large a quantity of antibodies as possible, and thus to prevent even those cases of rabies which incubate rapidly. By this method Fermi's unsuccessful cases were nil and partial failures—i.e., mortality during the course of treatment—were only 0·1 per cent. Experiments on animals also showed a superiority of 30, 50, and even 100 per cent. over the methods of Pasteur, Calmette, and Babes. A further advantage is simplicity of preparation, Pasteur's method requiring attenuation of the virus by drying, Calmette's by immersion in glycerine, and Cumming's by dialysis. Semple, director of the Central Research Institute at Kasauli, in India, introduced a modification of Fermi's method, in which he renders a virus of 8 per cent. completely avirulent by keeping it for 24 hours at a temperature of 37° C. and diluting at the moment of using it with half its bulk of physiological salt solution. But Fermi is of opinion that this preparation is not sufficiently sterile and is not so efficacious as his own serum vaccine; moreover, it is less convenient to use and more difficult to prepare, while his experiments on animals, comparing the two preparations, showed that while Semple's modification saved 66 per cent. of inoculated dogs, Fermi's method saved 100 per cent.

An Index of Differential Diagnosis of Main Symptoms. By Various Writers. Edited by HERBERT FRENCH, M.A., M.D.Oxon., F.R.C.P. Lond. Second edition. Bristol: John Wright and Sons, Ltd. 1917. Pp. 912. Price 42*s.* net.—The first edition of this stately volume has been exhausted within five years, and whilst leaving the general character unchanged, the editor has added new articles, revised all the old ones, and nearly doubled the number of illustrations. These are not only excellently reproduced, but deal with real difficulties in diagnosis and the newer differentiating criteria which are for the most part only accessible in scattered publications. The book is, in fact, a post-graduate course for the practitioner, and should, as we said on its first appearance, materially help in the rational diagnosis of disease.

LITERARY INTELLIGENCE.—Messrs. J. W. Arrowsmith, Limited, of Bristol, have in the press a history of the Bristol Royal Infirmary, written by the late Dr. G. Munro Smith, consulting surgeon to the infirmary, and telling the story of the institution from the year 1735 to the present time. The volume contains 500 pages of text and about 50 leaves of portraits and other illustrations.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—The subjects of prizes are announced as follows:—(1) Triennial prize: "The Development of the Hip-joint and the Knee-joint of Man"; (2) Jacksonian prize, for 1917: "The Causation, Diagnosis, and Treatment of Traumatic Aneurysm, including Arterio-venous Aneurysm; for 1918: "Injuries and Diseases of the Pancreas, and their Surgical Treatment." The conditions under which the prizes are to be written for may be obtained on application to the secretary, Royal College of Surgeons, Lincoln's Inn Fields, London, W.C. 2.

THE LANCET.

LONDON: SATURDAY, MAY 5, 1917.

Toxin and Antitoxin: Tetanus Problems.

WE have taken the unusual course of devoting the whole of the original papers in this issue of THE LANCET to discussion on the best method of administering antitoxin in cases of developed tetanus. While, however, the particular question affects a relatively small number of patients—although for them it is not merely a matter of life and death but one of possible relief from torment—a careful study of the series of articles will introduce the reader to problems of general application, not alone to tetanus or even to gunshot wounds, but to the whole range of medical practice, involving such concepts as the principles of immunity and the value of evidence. It is only a few weeks since EMIL VON BEHRING passed away, and even a cursory view of his life-work reveals the fact that the discovery of antitoxin, which seemed at first sight to afford a simple solution of the treatment of bacterial disease, was but the fortunate prologue of a drama which was to become more and more intricate in the later acts. To VON BEHRING toxin and antitoxin may well have appeared as chemical antidotes capable of neutralising one another, although EHRLICH, at all events, never considered them to be simple substances of strong affinities, like caustic soda and hydrochloric acid. But toxin and antitoxin were soon found apparently capable of existing side by side, and toxin's fatal habit of combining firmly with important cells of the body, not to be called off subsequently by antitoxin, was seen to be a ruling factor in practical problems of immunity. VON BEHRING himself clearly saw the necessity of preventing toxin from combining with nerve cell, a proceeding on which the successful prophylactic treatment of tetanus in the present war has been based. Once the combination has taken place there is apparently little hope of dissociation, and all the papers which we print are directed towards the best means of preventing further toxin from reaching and fatally injuring the already damaged nerve cells. It is as though all the children in a particular district of a city had a fatal proclivity for poisoned sweets, and the municipality was discussing by what route the further supply of sweets could best be stopped, whether by patrolling the particular streets or by adding the proper antidote to the town water-supply.

Given the poisoned nerve centres and the preventive remedy, the most important single practical question is the method of bringing the latter to bear on the former. The possible routes are four: subcutaneous, intramuscular, intravenous, and intrathecal. The reader should refresh his memory of an article by Colonel Sir W. B. LEISHMAN and Major A. B. SMALLMAN, published in THE LANCET of Jan. 27th, in which 160 cases of tetanus, occurring during the first four months of the battle of the Somme, were submitted to elaborate analysis. The conclusion was then reached that the intravenous route offered the worst prospect of success, while the intrathecal route was very little better. The most successful results appeared to follow intramuscular injection. On the other hand, the War Office Committee for the Study of Tetanus has consistently advised the intrathecal route as the best, and the articles in this issue by the chairman and certain members of the Committee, by tetanus inspectors, and others, may be taken collectively as the Committee's reply to the doubts cast by Sir WILLIAM LEISHMAN and Major SMALLMAN upon the value of the intrathecal route. The evidence upon which the latter relied was essentially statistical, and the justification for their conclusions is dealt with by Captain M. GREENWOOD, who has submitted their figures to the tests commonly employed by the statistician, and who finds that the variation in case mortality from group to group was such as might easily have arisen by chance within a uniform population. Sir DAVID BRUCE in an analysis[1] of mortality figures of tetanus in this country during the first and second years of the war came to conclusions totally different from Sir WILLIAM LEISHMAN and his coadjutor. The statistician's criticisms apply with equal force to all three sets of figures. The conclusions of Major H. R. DEAN and of Major F. W. ANDREWES are based on evidence of a different kind. Both of them analyse small groups of cases coming directly under their own personal observation as inspectors, and their conclusions are also in direct opposition to those of Sir WILLIAM LEISHMAN and Major SMALLMAN, although they differ between themselves, inasmuch as Major DEAN is a strong advocate of the intravenous route, while Major ANDREWES no less strongly supports the intrathecal. Taken together it would seem that excellent results may follow the administration of antitoxin by either of these routes. There is finally presented the experimental evidence cited by Sir DAVID BRUCE on behalf of the Committee of which he is chairman. The experiments of Professor C. S. SHERRINGTON were carried out on animals closely allied to man with a care which can leave little room for cavil, and should go far to set at rest the doubts frequently expressed of the validity of reasoning from laboratory animals, such as dogs, rabbits, and guinea-pigs, to man himself. They confirm the value of the intrathecal route. Captain F. GOLLA'S experiments also emphasise the superiority of the intrathecal (and intravenous) routes over other methods.

The whole discussion is, as we have suggested, not merely of intrinsic interest, but of great value in view of the clear issues it raises on the difficulties of expert evidence. The statistician expresses doubt on the value of the analysis of clinical

[1] THE LANCET, Oct. 23rd, 1915, and Dec. 2nd, 1916.

results, alleging that the figures when examined do not admit of any clear conclusions being drawn. The clinician questions the deductions of the experimenter who deals with animal conditions not necessarily applicable to man. The experimenter cannot accept the statistician's conclusions at his own value, and queries the necessity of elaborate analysis where convincing ocular demonstration lies ready to hand. The outside observer notes with interest how long such questions as the value of the antitoxin treatment of tetanus may remain in doubt. A generation ago the late Professor KANTHACK impressed on his pupils the division of cases of tetanus into three groups: the hopeless cases with short incubation period, those long in incubating which recovered whatever the nature of the treatment, and a small intermediate group on which alone the value of treatment could be demonstrated. A year or two ago Professor SAHLI, of Berne, entered the lists as a protagonist of the value of fine statistics in contradistinction to what he termed coarse ones. He contended that a deduction based on a number, though small, of accurately observed cases was a kind of statistical method affording a much greater chance of correctness than the method of large or grouped statistics. He gave as an obvious illustration the effect of opening an abscess, remarking that in such an instance the method of coarse statistics might indeed be used but was superfluous, inasmuch as clinical observation could answer such questions at sight and therefore much more quickly and with less trouble. An inquiry into the treatment of pneumonia among South African natives published in THE LANCET of Dec. 14th, 1912, gave Sir ALMROTH WRIGHT and others occasion for a similar comment on the spheres of application of the experiential and statistical methods. Where, they say, there is a shorter and a longer way it will be well not to choose, *on principle*, the longer. In medicine, SAHLI added, that alone stood on a firm basis which had been clearly seen and experienced personally. We commend these wise sayings to our readers in their perusal of the articles in this issue.

The Health of Munition Workers.

AN interim report upon industrial efficiency and its relation to fatigue as seen among the munition workers has been presented to the Ministry of Munitions by the Health of Munition Workers Committee, over which Sir GEORGE NEWMAN presides.[1] The report bears out in every particular views that have been expressed in our columns both by correspondents and editorially, for it refers to "a pronounced and common symptom of industrial fatigue which appears to be the reflection in the workman's general health and spirits of the results of accumulated nervous fatigue rather than a direct or measurable sign of it." The report embodies a statistical study by Dr. H. M. VERNON upon output in relation to hours of work; a most valuable investigation by Professor T. LOVEDAY into the causes and conditions of lost time, in which it is suggested that insufficient allowance is generally made for the extent to which lost time is caused by sickness, partly owing to the difficulty of obtaining trustworthy medical certificates; interesting inquiries into the health of males and of females engaged in the factories, made respectively by Captain T. H. AGNEW, R.A.M.C., and by Dr. JANET CAMPBELL and Dr. LILIAN WILSON; and authoritative memoranda by the Committee upon the causes of industrial fatigue, the comparative efficiency of day work and night work, and the influence of wages as an incentive to industry. The report may be said, therefore, to take a truly comprehensive view of a widely ramifying subject, and it deserves the close attention from medical men which it will undoubtedly receive.

The Committee define fatigue as the sum of the results of activity which show themselves in a diminished capacity for doing work. Analysis of the manifestations and features of fatigue has led them to the conclusion in one of their published memoranda that the condition depends not upon the using up of the substances supplying the chemical energy liberated during work—bodily sensation being a fallacious guide—but upon the accumulation within the living elements of the products of the chemical changes involved. The problems of industrial fatigue primarily, and almost wholly, are those of nervous default owing to such accumulation. The data on which this conclusion is based have been collected by various investigators in regard to the effect upon output of employing men and women at night either on the discontinuous system, under which a worker is employed for weekly periods alternately by night and day, or on the continuous system, under which a worker is employed continually at night for a long period; and the recommendation of the Committee is that for women it is undesirable to adopt continuous night shifts in any factory, and that for men, though the evidence is not so pronounced, the advice has general application. Captain AGNEW'S study of the health of the male workers is based upon the examination of 1543 men 41 years of age and upwards and 1509 boys 18 years of age or under. In order to make his data as trustworthy as possible and capable of forming an objective basis for administrative action, Captain AGNEW classified the examinees solely upon the result of his examination of them, and without any reference to their hours of labour or conditions of work until the reports upon each factory were being compiled. He appends to his report a series of recommendations of which the most important is a reduction of excessive hours of work, especially when bad transit lengthens the working day, and in the case of boys. The general conclusion of the Committee, after what has obviously been a close and learned investigation of the problems presented in the study of industrial fatigue among the munition workers of both sexes, is that the application of scientific lessons in respect to greater efficiency is hampered by a lack of observation of the available facts, an ignoring of the teachings of science by those in authority, and a lack of endeavour to promulgate

[1] London: His Majesty's Stationery Office. 1s. 3d. net.

existing knowledge or to establish intercommunication between different firms, whereby individual experience could become common property. The Committee accordingly emphasise the need of some permanent organisation for the collection of scientific data, to be used in the solution of industrial problems. Their conclusion is justified by every word of the report, with its accompanying documents.

With one practical point, suggested by the evidence collected, the Health of Munition Workers Committee have dealt promptly. Industrial fatigue arises insidiously, and it is a matter of experience that a brief remission of work, if given in time, will prevent the condition going on to inefficiency. But in this situation both employers and employees require all the assistance that can be obtained from trustworthy medical certificates. Various witnesses called the attention of the Committee to difficulties which have arisen in regard to medical certificates put forward by munition workers in support of absences from work on account of illness. It appears that on some certificates no information is given as to the cause of illness, as to its probable duration, or as to whether immediate absence from work is essential or can be postponed until a particular job has been completed. In order to meet these difficulties the Committee have prepared a form of certificate which should, in their opinion, afford the desired information, and at the same time be easily and quickly filled in. It is suggested that in the case of national factories copies of this form of medical certificate should be supplied to panel practitioners and other medical practitioners in the neighbourhood, with a request that the form may be used for all medical certificates given to munition workers. The certificate is what it claims to be, a simple document, on which the medical practitioner certifies the diagnosis and answers questions as to the need for the immediate cessation from work and the probability of the break-off being for longer than a week. We may mention that in the absence of the coördinated scientific knowledge, deplored by the Committee, the giving of such certificates will entail a new responsibility of a delicate nature upon the medical profession.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary Comitia was held on April 26th, Dr. Frederick Taylor, the President, being in the chair. The minutes of the Comitia held on April 2nd and of the Censors' Board were read and confirmed. Licences to practise physic were granted to 101 candidates, who, having conformed to the by-laws and regulations, had passed the required examination. The following gentlemen were elected to the Fellowship of the College:—Dr. R. H. Cole, Dr. D. N. Nabarro, Dr. H. W. Gardner, Dr. J. T. Calvert, Dr. R. H. Miller, Dr. C. F. Coombs, Dr. P. W. Saunders, Dr. W. E. Hume, Dr. H. MacCormac, Dr. C. J. Singer, and Dr. E. P. Poulton. The following resolution from the Committee of Reference was received:—

That in consequence of (1) the depletion of the staffs of the hospitals and medical schools; (2) the reduction in the number of students; (3) the amount of time necessarily devoted by students in their fourth and fifth years to practical clinical work owing to the shortage of resident medical officers—the Royal Colleges of Physicians and Surgeons be requested to consider the desirability of suspending, during the period of the war, the regulations that students should attend systematic courses of lectures.

This was referred to the Committee of Management for consideration and report. Sir Seymour Sharkey was re elected a Representative on the Senate of the University of London.

Annotations.

"Ne quid nimis."

THE PHYSICAL WELFARE OF MOTHERS AND CHILDREN.

THE two handsome volumes just issued by the Carnegie United Kingdom Trust are but a first instalment of a comprehensive report on the existing provision for promoting the physical welfare of mothers and young children, which will include Ireland as well as the whole of the United Kingdom. The first volume has been compiled by Dr. E. W. Hope, medical officer of health for Liverpool, and is based on information supplied by the sanitary staff all over the country, to whom appropriate schedules were supplied to fill in.[1] A summary of these returns fills a large part of the volume. Dr. Hope considers, and we agree with him, that the country is thoroughly awakening to the necessity for more active interest than has hitherto been taken in the care of maternity. An admirable series of charts and diagrams illustrate the saving of life achieved in recent years by intelligent and well-directed procedure. The lesson which Dr. Hope draws from the results of the inquiry, besides the need for more welfare centres and maternity homes, the latter especially in rural areas, is the importance of improved education in the various branches of the science of public health and of encouraging research into the circumstances adversely affecting infancy and motherhood. The second volume contains a careful study of the midwife by Dr. Janet M. Campbell, one of the senior medical officers of the Board of Education. Dr. Campbell states that a large proportion of midwifery practice is now in the hands of midwives and assumes that it is likely to remain there. This being so, it is urgently necessary to attract well-educated women to the study and practice of midwifery, and having attracted them to provide them with proper training and an adequate status and remuneration. This report, along with Sir Arthur Newsholme's recent report on the causes of infantile mortality, affords adequate material on which to base efficient methods of remedying acknowledged evils.

THE INCIDENCE OF INSANITY DURING THE WAR.

THE stress of the conditions of war might be expected to lead to mental breakdown, at all events in persons of unstable mentality. But so far the evidence available, which we have dealt with on several occasions,[2] has not confirmed any increase of insanity. In his recent annual report to the visiting committee of the City of London Asylum Dr. R. H. Steen returns to the question again, and finds "no evidence of any increase in insanity during the past two and a half years," adding, in fact, "it is highly probable that there has been an appreciable decrease." His own explanation of this decrease is based on the following considerations. It is generally admitted that in bad times insanity decreases, while in good times with abundance of money insanity increases. The reason for this is supposed to be found in the fact that in times of plenty there is more drunkenness, in times of want less drunkenness. In this respect the present period is exceptional, for, though the working classes have been enjoying a period of unexampled

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[1] THE LANCET, 1916, ii., 28.
[2] THE LANCET, 1915, ii., 352, 771, 937; 1916, i., 369; 1917, i., 386.

prosperity, less alcoholic liquor has been consumed and the number of convictions for drunkenness has been reduced. If any increase in insanity in the country had occurred it would have been at once noticed in an increase of the admissions to the public mental hospitals. Regarding the patients themselves, Dr. Steen says that, although the daily papers circulate through the wards, and many patients take a great interest in the events recorded, the total effect is inappreciable.

An apparent exception to this general statement is now recorded from Ireland. In the sixty-fourth annual report of the Inspectors of Lunatics (Ireland) dealing with the year 1914 it was pointed out that whereas an increase in the number of admissions due to mental stress might have been expected owing to war conditions, no such increase, as a matter of fact, was shown by the figures at disposal. The percentage of the total admissions to asylums in which mental stress was assigned as a factor in the causation of insanity in 1914 was 16·9, and was practically identical with that of the two preceding years, while the percentage in which it was regarded as the principal factor was 11·4, showing a small reduction on that of the same two years. The war had, however, then only lasted five months. In the sixty-fifth report, which has now just been issued, it is shown that amongst the admissions for the complete year 1915 no less than 19·2 per cent. were attributed wholly or partially to mental stress, while in 13·3 per cent. this was assigned as the principal cause. Further analysis showed that it was possible to attribute to war conditions some direct part in the causation of over 1 per cent. of the admissions for the year, and a predominant part in 0·32 per cent., while two-thirds or more of the cases so caused were not, as might have been expected, recurrent cases, but first attacks. Women suffered more severely than civilian men from the mental effects of the war. The incidence of insanity among the fighting men is touched upon, but the figures are found insufficient to afford material for conclusions. We may well separate the two inquiries. The rôles of active participation and of passive spectator are so different that their results are hardly likely to afford useful comparison. Everyday experience suggests that the latter is the more liable to upset mental balance, and some confirmation that this is the case may be forthcoming from neutral countries.

CLEAN MILK.

THE dangers to which the community is continuously exposed by the contamination of the milk-supply are set forth in a pamphlet just issued by the National Clean Milk Society, whose avowed objects are to raise the hygienic standard of milk products and to educate the public in the importance of a clean and wholesome milk-supply. A useful form of public education is afforded by a well-executed poster illustrating the unlimited opportunities of soiling undergone by milk between the cow and the bottle-fed baby. The pamphlet contains the result of an investigation into the hygienic quality of the milk supplied to babies attending certain schools for mothers. In samples supplied by 27 dairymen to seven London schools the Lister Institute of Preventive Medicine found the colon bacillus in every case and twice the tubercle bacillus as well. Both were found in a sample of milk contained in a glass bottle stated to have been sent direct from the farm to the consumer. Such a condition of things would not be tolerated in many of the large American cities, and local authorities in this country ought to be in a position to prevent the sale of such an article of diet. The figures quoted, and other replies received in answer to questions addressed to all schools for mothers throughout Great Britain and Ireland, have led the society to draw the melancholy conclusion that for all practical purposes the subject of clean hygienic milk has been ignored in England. Pending more effective action by local authorities, the pamphlet suggests certain steps which might be taken by those responsible for the feeding of young children, including the unexpected visit to the farm at milking-time and the filling in of a "score card" for dairy farm inspection supplied by the society. The pamphlet should command attention as dealing with a vital national question, and its study will, we hope, result in a substantial increase of the membership of the National Clean Milk Society, whose address is 2, Soho-square, W. 1.

FRAGILITAS OSSIUM, BLUE SCLEROTICS, AND OTOSCLEROSIS.

UNDER the general term "fœtal rickets" were at one time placed somewhat varied types of cases which have since been clinically dissociated and are now recognised as definitely separate pathological conditions. Achondroplasia was one of these conditions, cretinism another, whilst the term osteogenesis imperfecta, or fragilitas ossium, embraced the third. The present remarks appertain mainly to the last of these groups. An instructive paper upon the subject is published in the *Edinburgh Medical Journal* (April, 1917) by Dr. E. Bronson. He records two families which presented hereditary fragility of the bones, associated with which was the presence of grey-blue sclerotics and, in the first family, otosclerosis. The first family (C——) was traced through four generations. Four features were noticeable. 1. The liability to fractures. In none were there fractures at birth; the earliest age for fracture to occur was one and a half years. Dislocations were nearly as frequent as fractures. One member had 13 fractures, though no members presented that unusual proneness to such accidents as is shown by non-familial cases. 2. Unusual prominence of the frontal and occipital bones, without the typical squareness of the rickety head. 3. Grey-blue sclerotics, due, apparently, to increased translucency rather than to decrease in thickness, was present in all cases which showed fractures and was absent in those members who failed to show this liability. 4. Progressive deafness, starting in early adult life, was present in seven individuals; the cause of this condition is not clear. The second family (T. W——), traced through three generations, presented somewhat similar features, excepting that there was no deafness and the bony changes in the head were different, showing an increase in the bitemporal diameter. To these two familial instances of fragilitas ossium are added accounts of three isolated, non-hereditary examples of the same condition. In two of these cases there were pre-natal fractures; in the third fracture occurred soon after birth. All showed grey-blue sclerotics, but less marked in character; in all there were bony changes, in one instance dwarfing, in another bony rarefaction, in a third deformity in shape of the head. The pathology of fragilitas ossium is obscure. The only known factor is heredity—by direct transmission—but

this is not always present. Syphilis plays no part in the causation. Theories only can be suggested to explain the shortness of stature in these cases; certainly it is not explainable, as in achondroplasia, by defective cartilaginous proliferation. The fractures are often painless, and union is usually rapid. The legs are most frequently involved, especially the thighs. Few metabolic or chemical observations have been made in this disease. There appears to be a deficient functional activity of the osteoblasts, whether these have to do with subperiosteal or enchondral ossification. Treatment seems of no avail. Whilst cases of fragilitas ossium of the pre-natal type present striking morbid features, especially in the bony changes in the head, the child seldom surviving, and whilst they have been classed as separate clinical entities from the type here described, the author considers that these two conditions own a common cause or pathology whether its effects be pre-natal or post-natal in their incidence. Especially suggestive evidence in support of this view is the fact that one of the cases detailed (Case 2) had fractures at birth, but survived, yet her appearance and physique so closely resembled one of the hereditary cases (family of T. W——) with later fractures that they were regarded, when shown at a medical meeting, as sisters. A critical résumé of the literature on the subject adds to the value of this interesting article.

PLACENTAL TRANSMISSION.

THE manner in which the materials necessary for its growth and repair are supplied to the fœtus and its waste products removed has always been a problem of absorbing interest. That the placenta acts as the nutritive and excretory organ of the fœtus is commonly accepted, but the proof of this is chiefly indirect. It is a subject for further investigation whether the placenta acts as a transmitter of certain substances by a process of simple diffusion, or whether it has the power of altering their chemical constitution so as to render them more readily absorbable, or the power of rejecting them altogether. The materials necessary for the growth of the fœtus must be absorbed from the maternal blood through the chorionic villi, and its waste products eliminated in the same manner. While it seems certain that some chemical substances may pass into the fœtal body by simple diffusion, it is equally certain that the chorionic villi have a selective activity and are able to choose substances required for the growth of the fœtus and even to store up in the fœtal body certain materials which are equally needed by the mother so as to cause in her body an actual shortage of these substances. Such a state of affairs may occur in cases of anæmia and osteomalacia in which apparently iron and calcium pass over to the fœtus to the detriment of the maternal tissues which are lacking in these substances. That certain bodies can pass from the maternal blood to the tissues of the fœtus has been proved in the case of the human subject, and even more conclusively in the case of animals. It may be stated further, without fear of contradiction, that the placental route is the only one by which the fœtus can be nourished. It is not possible even at the present time to assert whether any given substance passes to the fœtus by a simple process of diffusion or whether it is altered in any way in its passage through the chorionic villi. In the same way the waste products of tissue change in the fœtus may pass out of its body by simple diffusion or may be actively eliminated by the cells of the villi. A great deal of work has been and is being done on this subject. The investigation is naturally a very difficult one, and great care should be required in interpreting the results obtained. As E. D. Plass, in a recent paper in the *Johns Hopkins Hospital Bulletin*, has pointed out, according to the diffusion theory the plasmas—the fluids on the two sides of the supposedly permeable membrane—should contain the same amount of all soluble diffusible substances, whereas according to the secretory theory a difference might occur in the concentration of the same substance on the two sides of the active membrane when the need for it was greater in one organism than the other or, when its presence was actually harmful. He argues that in such investigations it is really necessary to consider the plasma of the bloods separately from the corpuscles. In a determination of the quantity of creatinine in maternal and fœtal blood he found that the amounts are practically the same, and concludes that creatinine passes between the mother and child by simple diffusion. In another investigation on the obstetrical significance of the blood sugar W. H. Morriss showed that the concentration of glucose in the maternal and fœtal blood is such that the placental interchange may be explained by the process of simple diffusion. These investigations are valuable for the light they throw upon one side of the problem, but we are still largely in the dark with regard to the selective activity which the cells of the chorionic villi undoubtedly possess. Have they, too, the power of storing up certain substances? The intra-vitam method of staining, introduced by Goldmann of Freiburg, is of great interest in this connexion; and the fact that while, in the early stages of pregnancy, the stained cells are found in the placenta and the granules of pyrrhol-blue are eagerly taken up by the fœtal cells, in the later months of pregnancy the dye cannot pass the layer of cells intervening between the fœtal and maternal tissues of the placenta is one of great interest and importance. It is to be hoped that further investigation may throw more light upon these important problems.

A PUBLIC HEALTH LABORATORY FOR NORTH WALES.

IN November last Dr. Emyr Owen Price, of Bangor, by impressing on some local medical men the advisability of starting a laboratory in the area where pathological specimens could be examined for private practitioners and sanitary authorities, laid the foundation of what is turning out a large movement. Those before whom Dr. Price placed his views having welcomed them, a medical deputation waited upon the Senate of University College, North Wales, and urged that body to give practical effect to the idea. The appeal made to the Senate indicated the functions of the proposed laboratory as follows: (1) To examine and report upon pathological material, products of disease; (2) to prepare vaccines from material supplied; and (3) to carry on research work. Sound arguments were adduced why the College should be glad to welcome the scheme. At present all such work is carried on for North Wales by commercial enterprise in London, Liverpool, and Manchester. This is clearly a waste of individual opportunities for medical research when it can be conducted in the scientific depart-

ment of a recognised medical centre. Moreover, the medical practitioners of North Wales are embarrassed by having to send pathological material to places remote from its gathering ground, and ought to be able to obtain through the College in their centre advice and assistance in the more scientific side of their professional work. These points were well brought out in the representations made to the College by the medical deputation, and as a result the Council of the College adopted cordially the idea put before them. Indeed, they went further, for not only is a bacteriological institution to form part of the new science buildings of the College, but a comprehensive public health laboratory is to be founded, and a draft scheme with this object has now been made public. From this scheme it appears that the work of the laboratory or institute, under its bacteriological or chemical sections, will be well designed to meet the needs in North Wales of medical men, sanitary authorities, agricultural bodies, and veterinary practitioners, and we wish the new enterprise every success.

SCHOOL REFORM IN THE FUTURE.

A MEMORANDUM has been issued by the Child Study Society upon the educational principles which should direct future school reform, in which the importance is pleaded of basing educational methods on sound child-psychology, paying attention to emotional, moral, and æsthetic activities. The ideal curriculum, says the memorandum, should consist largely of life-sustaining occupations with more and more intellectual studies grouped around them, instead of the education being directed towards the general training of abstract faculties. Children should at school do necessary, and therefore to them interesting, work as well as satisfy their intellectual curiosity. This need of children to be interested begins to be marked at the stage between babyhood and school-age proper—i.e., about 6–8 years of age—and specialists and psychologists are asked to devise an educational syllabus fitted to this transitional period, when individual freedom begins to clash with the self-control demanded for school-life. The recognition of the child's outlook and the introduction of topics of instruction at the moment appropriate for the cöoperation of the native instinctive impulses have in considerable measure arisen from the mutual efforts of the scholastic and medical professions, and owe much to pioneer work among defective children. The further development of the new pedagogy is mainly a task for the teacher, and will involve patient and carefully correlated experiments. The memorandum urges the promotion of research in education by the provision of the necessary facilities and financial assistance, and by the appointment of a strong Educational Research Board to assist and coördinate the work. It points out that such a board could be constituted on similar lines to the Medical Research Committee. Much individual research is actually carried out the results of which remain unknown save in local circles, while its application and value suffer from lack of facilities for discussion prior to publication. Were experimental and observational schools or classes to be established, both in their educacational and medical bearings, many problems could be considered, when results might be worked out under competent control. The problems of child-study may be essentially for the scholastic profession, but it is most desirable that the activities of the educational medical officers should not be confined entirely to questions of the health of individual children. They should embrace the wider range of educational hygiene, and we are glad to know that many of these officers are showing practical agreement with this view. Such practical child-study is essential to progress, and the results of the investigation of abnormal children in the past have been so fruitful as to promise well for the future, particularly if attention be paid not only to the phases of intellectual development but to the early stages of emotional and volitional life. Coördination of research, as well as wider spread of knowledge of results already achieved, is the great move that should now be taken. There should be opportunities for discussion and for the wide circulation of research in connexion with child-study and education. A central board, such as the memorandum desires, could not only suggest general topics, but also determine in broad outline the necessary procedure, issuing directions on lines which could be followed with a minimum expenditure of time. Uniformity of effort, which is at present wanting in official returns and reports, whether on educational progress or medical inspection, would thus be secured. So far as the strictly medical side of child-study is concerned, there is need for facilities rather than for a special staff. An allowance of even a session a week for approved research, to be carried out on previously defined lines, would enable many problems to be solved, and would give an interest and zest to an occupation which on its routine side is monotonous for many whole-time officers. The establishment of further bonds of interest and opportunities for mutual work and discussion between the doctor and the teacher would be to the advantage of both and of profit, most of all, to the child.

ACUTE PULMONARY ABSCESS TREATED BY ARTIFICIAL PNEUMOTHORAX.

IN the *Journal of the American Medical Association* recently Dr. W. D. Tewksbury has called attention to a simple and rational method of treating acute abscess of the lung. He saw in consultation a case of acute abscess of the lung following operation on the nose, and advised as a rational procedure artificial pneumothorax, although its use had previously been confined to pulmonary tuberculosis, excepting a few cases of chronic pulmonary abscess and one case of interlobar empyema. The patient was a mining engineer, aged 32 years, who about the middle of June, 1916, was injured in an elevator, sustaining fracture of the superior maxilla and nose. An operation for repair of the nasal septum was performed on June 17th. He was apparently doing well until June 26th, when his temperature rose above 101° F., with pain in the chest and sweating. Pleurisy with a little effusion at the left base was found. The temperature remained high until July 12th, when he suddenly coughed up much purulent sputum, and a radiogram showed an abscess in the lower part of the right lung. After this the temperature remained about 102°, he lost weight, and sweated profusely at times. On July 22nd Dr. Tewksbury was called in consultation to consider the possibility of using compression of the lung. He advised waiting a little, both because the operation would be somewhat of an experiment and because of the pleurisy with effusion on the opposite side. The patient con-

tinued to expectorate much, lost weight, sweated profusely at times, and the temperature and leucocyte count remained high. On August 12th Dr. Tewksbury injected 150 c.c. of air into the pleural cavity, on the 14th gave another small injection, and on the 22nd a larger one, following which the temperature became normal. Injections were then given about once a week, making 10 in all. By Sept. 15th all cough and expectoration had ceased. The patient gained 20 lb. in weight and was discharged cured on Oct. 15th. The only unpleasant symptom caused by the injections was some dyspnœa and cyanosis on one occasion following an unusually large injection. In a second case a woman, aged 27, had acute abscess of the lung following tonsillectomy. There was much foul purulent expectoration. A radiogram showed a large abscess involving most of the upper and some of the lower lobes of the left lung. As she was extremely prostrated, Dr. Tewksbury was not at all optimistic when, four weeks after the onset, he started to collapse the lung. However, the temperature, pulse, and cough improved on the following day, and two days later he gave a second injection. That night she coughed up an unusually large amount of pus, and on the following day the temperature was normal, and it remained so thereafter. The possible value of this treatment is shown by the following considerations. The mortality of acute abscess of the lung treated medically is about 60 per cent., and the percentage of cures is only about 10. The results of rib resection and drainage are better, but the mortality is about 30 per cent. Moreover, this operation often leaves a sinus which may persist for a year or more. Artificial pneumothorax is, of course, applicable only in cases in which the abscess communicates with a bronchus. In an annotation in THE LANCET of Nov. 20th, 1915, we described a case of *chronic* pulmonary abscess—recorded by French writers—in which this treatment was successful.

WE regret to record the death in the Near East of Sir Armand Ruffer, C.M.G., president of the Sanitary Maritime Council of Egypt.

THE Annual Oration to the Medical Society of London will be given at 11, Chandos-street, Cavendish-square, W. 1, at 9 P.M., on Monday, May 14th, by Sir William Osler, F.R.S., his subject being "The Anti-Venereal Campaign."

MEDICINE AND THE LAW.

R. v. *Caley: Successful Appeal.*

THE Court of Criminal Appeal has allowed the appeal of Mr. W. B. Caley from a conviction at the Central Criminal Court upon charges of conspiring to defeat the provisions of the Military Service Acts and of contravening the Prevention of Corruption Act, 1906, upon which the appellant was sentenced recently by Mr. Justice Coleridge to 18 months' imprisonment in the second division. The case will be remembered as the "White City Case," the facts of which, as proved at the police court and at the Old Bailey, were widely reported at the time. The Lord Chief Justice, who delivered the judgment of the Court of Criminal Appeal, said that the main point for consideration was whether, when the case was viewed as a whole, there was sufficient evidence to support the verdict of guilty. There had been proof of a conspiracy, but the difficulty of the Crown had lain in proving that Mr. Caley had been a party to it. There was no evidence that he had received any of the money which had been taken by Mitchell, who was convicted at the same time as the appellant, and of which the other prisoners had had their share. Equally there was no evidence to prove that Mr. Caley knew that any of the reports or certificates given by him were false. Such evidence as there was, was, in fact, equally consistent with the appellant's innocence or guilt. The charges were in respect of five cases, in two of which Mr. Caley never classified the men at all. It had been argued that he made a report with regard to them which had been acted upon, but one of these two men was admitted to have been unfit for service through lameness, and Captain Cooper, who was stated to have acted upon the reports in question, was not called as a witness, though the prosecution had been challenged to call him. There was no evidence, therefore, that Captain Cooper relied on Mr. Caley's report, and if he did so there was no evidence that Mr. Caley had wilfully made a false report. Out of three other cases two had reference to detectives. In the third the Lord Chief Justice pointed out that even though the appellant had classified the man as B 3, and he had afterwards been re-examined and put in Class A, this was equally consistent with innocence and with guilt. One of the two detectives was passed for general service, the other was rejected as suffering from chronic synovitis and had admittedly suffered in the past from that disease. There was also evidence that he had complained of pain at the time of his examination. This man had paid money to Mitchell, but no part of it had passed to the appellant. The evidence in the case was not satisfactory, and the conviction upon it of the appellant could not stand. The conviction accordingly was ordered to be quashed.

Liability of a Husband for Medical Attendance on His Wife.

A correspondent has called attention to a case decided by the Divisional Court in February, to which we did not allude at the time, as it did not, on the surface, involve any new principle affecting the medical profession. We refer to it now as our correspondent describes it as resulting in "a bad position both for women and children who are left in England as well as for a doctor." He also observes rightly that "if the decision applies to doctors the law must apply to everybody who has given credit." The appeal was against a judgment of a deputy county-court judge sitting in the Brompton county court, in a case (Travers *v.* Sen) in which a medical man sued a married lady for the balance of his account for attending her in her confinement. The defendant had paid £25 and refused to pay more. At the close of the plaintiff's case counsel for the defendant submitted that there must be judgment for her on the authority of cases which he cited, as the action should have been brought against the defendant's husband and not against her personally. This contention was accepted by the deputy judge, and the judgment appealed against was entered for the defendant. The hardship involved in this for the medical man, of which our correspondent complains, lay in the fact that the husband of the defendant was in Rangoon and not easily to be proceeded against. The principle upon which the decision was based, that a wife has an implied authority to pledge her husband's credit for necessaries, which would include the services of a medical man in her confinement, is no new one, but the point was discussed at the hearing and in the Divisional Court as to how far the absence of the husband, separated from his wife, by the accident of his employment, affected his liability. In the Divisional Court, however, the dismissal of the plaintiff's appeal was not so much in consequence of the acceptance by the judges of the principle of law as upon a point of fact. Mr. Justice Atkin, in delivering his judgment, pointed out that the plaintiff had attended the defendant on previous occasions and had been paid by the husband. Letters also had passed between the plaintiff and the defendant and the husband in Rangoon, upon the present occasion, which indicated that the husband did not repudiate the charge but merely complained of its amount. There was, his lordship observed, plain evidence that the husband looked upon himself as liable, and the deputy judge was quite entitled to conclude that the defendant was contracting only as agent for her husband. Mr. Justice Bailhache concurred in this judgment, but he also discussed the question of whether the separation of husband and wife did away with the wife's authority to pledge her husband's credit, and expressed the view that a distinction existed between an intentional suspension of marital relations and the case before him, in which the absence of the husband from the wife was due only to the accident of his calling. He pointed out that the nature of the contract made must

be considered, and added, with regard to the case at issue, that there could hardly be a contract in which it could more reasonably be inferred that the liability was on the husband than an arrangement for medical attendance on the wife at the birth of her husband's child.

In comment on the above, and in view of our correspondent's complaint that the decision is a hard one for wives and children seeking medical aid in the absence of the husband abroad, and also for medical practitioners who may attend upon such, it may be pointed out, that in a large majority of cases the medical man, or any creditor, suing on a contract for necessaries supplied to the wife, has a better chance of obtaining the money from the husband than from her. It would be much harder on the medical man, in ordinary circumstances, if the law were such that he could not make the husband pay for attendance on the wife.

THE RADIUM INSTITUTE, LONDON.

THE report of Mr. A. E. Hayward Pinch, F.R.C.S., on the work carried on at the Radium Institute (Riding House-street, Portland-place, London, W. 1) over a period of two years, from Jan. 1st, 1915, to Dec. 31st, 1916, is an interesting document. A summary is given of the treatment of a large variety of morbid conditions, including carcinoma, rodent ulcer, sarcoma, lymphadenoma, mediastinal tumour, fibroid disease of the uterus, papilloma of the bladder, lupus vulgaris, nævus, cutaneous papilloma, lupus and other skin affections, as well as general diseases. The total cases dealt with numbered 1400, to whom 12.331 separate treatments were administered (more than 8000 of these free of charge to necessitous patients). Of these, 87 were examined but not treated, 123 were treated too recently to record results, and 33 received prophylactic irradiation only. Of the remaining 1157 cases, 172 were "apparently cured," 52 were "cured," 498 "improved," 215 "not improved," while 144 abandoned treatment, and 76 were dead. The Institute has rigidly adhered to a policy of declining to treat operable cases of malignant disease—rodent ulcer alone excepted—unless the patient has refused to submit to operation. Apart from this the cases treated were not selected, refusal to treat being based only on the grounds (1) that the patient was practically moribund, or (2) that radium treatment was clearly unsuitable.

We print the conclusions arrived at as to the value of radium treatment in two relatively common affections as a sample of the way in which the clinical material is dealt with by the Institute.

Rodent ulcer (186 cases).—This is of all forms of malignant disease the one which is most amenable to the action of radium. Lesions which have not been subjected to any previous treatment with X rays, CO_2 snow, ionisation, &c., which do not affect mucous membrane, bone or cartilage, and do not exceed 3 cm. in diameter, can almost invariably be cured by one treatment. A full-strength applicator is used unscreened, and an exposure of between one and a half and three hours' duration given, the length of exposure being determined by the amount of induration and infiltration present. The reaction which follows upon this procedure is usually severe, but the resultant scar is smooth, supple, and inconspicuous, and the tendency to recurrence extremely slight. When the extent, position, or character of the ulcer precludes the possibility of strong unscreened exposures, the best results will probably be attained by prolonged exposures with heavily screened apparatus. The much thickened and indurated edges so often met with in cases of very long standing respond very satisfactorily to the action of powerful emanation tubes screened with 0·6 mm. of platinum and buried in the thickened border for from 12 to 18 hours.

Fibroid disease of the uterus (7 cases).—Satisfactory results are often observed to follow upon the radium treatment of this disease, more especially when menorrhagia and metrorrhagia are the most prominent and troublesome symptoms. When all ordinary methods of treatment have failed and the patient declines to submit to operation radium therapy is well worthy of trial, as it will almost certainly lessen or abolish the excessive loss of blood, and will, in addition, sometimes produce considerable diminution in the size of the uterus. Treatment is best carried out by the introduction of a tube containing 100 mgr. screened with 2 mm. of lead into the body of the uterus—or if this be impracticable, into the posterior fornix—supplemented by a plate of from 80 to 100 mgr. screened in similar fashion, and applied on the abdominal wall above the fundus uteri. The total exposure should be not less than 30 hours' duration, and the series should be repeated after two or three months. The period immediately succeeding the radium application is often more profuse than usual; then the metrorrhagia is checked, and this is followed by a progressive decrease of the menorrhagia, until the flow becomes normal: or, as is sometimes seen in very susceptible subjects, amenorrhœa occurs, and persists for four, six, or more months.

Mr. Pinch informs us that with increasing experience and with the use of larger quantities of radium the results obtained are now distinctly more encouraging than at first. He acknowledges his indebtedness to Dr. J. E. A. Lynham, who has been for two years solely responsible for the conduct of the night clinic. A note on the chemico-physical laboratory of the Institute by the director, Mr. W. L. S. Alton, F.I.C., is appended. Copies of the report will be given to any medical man on application to the secretary of the Institute.

URBAN VITAL STATISTICS.

(Week ended April 21st, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 18·4, against 17·3 and 18·5 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 19·4, or 0·1 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 7·8 in Hornsey, 8·3 in Aberdare, and 8·7 in Wallasey, to 28·1 in South Shields, 28·7 in Wakefield, and 36·6 in Dudley. The principal epidemic diseases caused 489 deaths, which corresponded to an annual rate of 1·5 per 1000, and included 310 from measles, 66 from whooping-cough, 55 from infantile diarrhœa, 42 from diphtheria, 12 from scarlet fever, and 6 from enteric fever. The deaths from measles showed a slight decrease as compared with the number in the preceding week, and caused the highest annual death-rates of 3·4 in Oldham, 3·5 in Southend-on Sea 3·7 in Salford, 4·3 in Bolton and Sunderland, 6·2 in South Shields, and 8·4 in Dudley. The 730 cases of scarlet fever and the 1296 cases of diphtheria under treatment in the Metropolitan Asylums Hospital and the London Fever Hospital were respectively 8 above and 21 below the numbers at the end of the preceding week. Of the 5973 deaths from all causes in the 96 towns, 193 resulted from violence. The causes of 54 of the total deaths were uncertified, and included 10 in Liverpool, 9 in Birmingham, and 6 in Preston.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 18·1, against 16·9 and 19·1 per 1000 in the two preceding weeks. The 411 deaths in Glasgow corresponded to an annual rate of 19·2 per 1000, and included 29 from whooping-cough, 23 from measles, 3 from diphtheria, and 1 from scarlet fever. The 136 deaths in Edinburgh were equal to a rate of 21·4 per 1000, and included 14 from measles, 13 from whooping-cough, 3 from diphtheria, and 1 from scarlet fever.

Irish Towns.—The 200 deaths in Dublin were equal to a rate of 26·1, or 0·7 per 1000 less than that recorded in the previous week, and included 13 from measles, 2 from whooping-cough, and 2 from infantile diarrhœa. The 172 deaths in Belfast corresponded to an annual rate of 22·8 per 1000, and included 4 from measles, 3 from enteric fever, 2 from infantile diarrhœa, and 1 each from scarlet fever and diphtheria.

(Week ended April 28th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000, the annual rate of mortality was 16·7, against 18·5 and 18·4 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 16·8, or 2·6 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 6·4 in Ealing, 9·1 in Southend-on-Sea, and 9·2 in Ilford and Reading to 23·5 in Southport, 24·6 in Lincoln, and 27·6 in Gateshead. The principal epidemic diseases caused 433 deaths, which corresponded to an annual rate of 1·3 per 1000, and included 267 from measles, 57 from whooping-cough, 59 from infantile diarrhœa, 34 from diphtheria, 9 from enteric fever, and 7 from scarlet fever. The deaths from measles showed an increase of 43 from the number in the preceding week, and caused the highest annual death-rates of 2·7 in Middlesbrough, 2·8 in Southend-on-Sea, 2·9 in Salford, 3·1 in West Bromwich, and 4·3 in Bolton. The 720 cases of scarlet fever and 1212 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 10 below and 84 below the numbers at the end of the preceding week. Of the 5449 deaths from all causes in the 96 towns, 178 resulted from violence. The causes of 37 of the deaths were uncertified, and included 7 in Liverpool, 5 in Birmingham, and 3 in Gateshead.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 18·4, against 19·1 and 18·1 in the two preceding weeks. The 421 deaths in Glasgow corresponded to an annual rate of 19·7 per 1000, and included 38 from whooping-cough, 37 from measles, and 2 each from enteric fever, diphtheria, and infantile diarrhœa. The 122 deaths in Edinburgh were equal to an annual rate of 19·2 per 1000, and included 18 from measles, 9 from whooping-cough, and 1 each from diphtheria and infantile diarrhœa.

Irish Towns.—The 154 deaths in Dublin were equal to a rate of 20·4 or 5·7 per 1000 below that recorded in the previous week, and included 7 from measles, 4 from infantile diarrhœa, 1 from whooping-cough, and 1 from diphtheria. The 153 deaths in Belfast corresponded to an annual rate of 20·3 per 1000, and included 6 from infantile diarrhœa, 3 from measles, 3 from whooping-cough, and 1 from enteric fever.

VITAL STATISTICS OF LONDON DURING MARCH, 1917.

In the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the ten diseases specified in the table was equal to an annual rate of 4·4 per 1000 of the population, estimated at 4,310,030 persons; in the three preceding months the rates were 3·9, 4·0, and 4·2 per 1000 respectively. The lowest rates in March were recorded in Kensington, Hammersmith, the City of Westminster, Stoke Newington, and Wandsworth; and the highest rates in St. Pancras, Bethnal Green, Southwark, Bermondsey, and Deptford. The prevalence of scarlet fever showed a slight decline from that recorded in the preceding month; this disease was proportionally most prevalent in St. Marylebone, St. Pancras, Finsbury, the City of London, Bethnal Green, Stepney, Camberwell, and Lewisham. The Metropolitan Asylums Hospitals contained 785 scarlet fever patients

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING MARCH, 1917.

(*Specially compiled for* THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1915.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.								Deaths from all causes.	Death-rate per 1000 living.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON...	4,310,030	—	425	660	—	39	—	22	240	58	5	1449	4·4	—	340	7	56	38	3	67	511	1·5	6042	18·2
West Districts :																								
Paddington	131,397	—	10	11	—	—	—	1	8	2	—	32	3·2	—	11	—	3	4	—	5	23	2·3	200	19·8
Kensington	155,796	—	10	17	—	—	—	—	6	3	—	36	3·0	—	7	—	1	2	—	2	12	1·0	197	16·5
Hammersmith ...	118,559	—	13	6	—	—	—	—	6	1	1	27	3·0	—	2	—	—	—	—	—	2	0·2	154	16·9
Fulham	151,161	—	16	21	—	—	—	1	7	4	—	49	4·2	—	24	—	—	2	—	6	32	2·8	212	18·3
Chelsea	58,421	—	4	6	—	2	—	—	2	1	—	15	3·3	—	1	—	—	—	—	2	3	0·7	104	23·2
City of Westminster	135,104	—	10	14	—	—	—	1	5	2	—	32	3·1	—	11	1	—	1	—	2	15	1·4	197	19·0
North Districts :																								
St. Marylebone ...	100,260	—	15	16	—	—	—	—	9	1	—	41	5·3	—	37	—	—	3	—	3	43	0·6	156	20·3
Hampstead	81,760	—	5	13	—	—	—	—	3	2	—	23	3·7	—	1	—	—	—	—	—	1	0·2	74	11·8
St. Pancras	209,322	—	24	44	—	1	—	1	14	1	—	85	5·5	—	27	1	2	1	—	4	35	2·3	313	20·4
Islington	316,242	—	34	46	—	2	—	3	20	3	—	108	4·5	—	18	—	3	3	—	8	32	1·3	460	19·0
Stoke Newington...	50,527	—	1	6	—	—	—	—	2	—	—	9	2·3	—	—	—	—	—	—	—	—	—	70	18·1
Hackney	217,883	—	15	30	—	1	—	3	16	4	—	69	4·1	—	—	—	1	1	—	—	2	0·1	292	17·5
Central Districts :																								
Holborn	40,405	—	3	6	—	1	—	—	1	—	—	11	3·5	—	6	—	—	—	—	1	7	2·3	55	17·7
Finsbury	76,915	—	11	13	—	—	—	1	6	—	—	31	5·3	—	1	—	1	1	1	2	6	1·0	110	18·6
City of London ...	19,461	—	5	1	—	—	—	—	—	—	—	6	4·0	—	—	—	—	—	—	—	—	—	19	12·7
East Districts :																								
Shoreditch	103,627	—	8	24	—	1	—	—	5	2	—	40	5·0	—	—	—	5	1	—	2	8	1·0	141	17·7
Bethnal Green ...	120,207	—	20	24	—	2	—	—	7	1	—	54	5·9	—	8	—	3	1	—	1	13	1·4	151	16·4
Stepney	265,731	—	34	48	—	7	—	—	15	—	1	105	5·2	—	10	1	5	2	—	3	21	1·0	345	16·9
Poplar	156,247	—	10	32	—	7	—	1	12	—	—	62	5·2	—	11	—	4	—	—	5	20	1·7	250	20·9
South Districts :																								
Southwark	179,424	—	19	41	—	1	—	2	19	5	—	87	6·3	—	12	1	3	5	—	4	25	1·8	304	22·1
Bermondsey	117,188	—	7	39	—	1	—	—	7	1	—	55	6·1	—	17	—	2	2	—	1	22	2·4	212	23·6
Lambeth	284,188	—	23	55	—	2	—	5	8	5	—	98	4·5	—	25	1	11	1	—	2	40	1·8	413	18·9
Battersea	161,945	—	14	16	—	1	—	—	10	4	—	45	3·6	—	29	1	—	1	—	2	33	2·7	219	17·6
Wandsworth	312,249	—	31	18	—	—	—	1	10	4	1	65	2·7	—	51	1	1	4	1	3	61	2·5	426	17·8
Camberwell	254,385	—	32	33	—	3	—	1	15	7	1	92	4·7	—	16	—	3	3	—	4	26	1·3	330	16·9
Deptford	110,299	—	9	24	—	1	—	—	14	3	—	51	6·0	—	1	—	1	—	—	1	3	0·4	149	17·6
Greenwich	96,385	—	7	19	—	2	—	—	2	1	—	31	4·2	—	8	—	5	—	—	—	13	1·8	168	22·7
Lewisham	164,438	—	22	15	—	2	—	1	7	1	—	48	3·8	—	1	—	2	—	—	3	6	0·5	163	12·9
Woolwich...	129,505	—	13	22	—	2	—	—	4	—	1	42	4·2	—	5	—	—	—	1	1	7	0·7	158	15·8
Port of London ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

at the end of March, against 800 and 811 at the end of the two preceding months; the weekly admissions averaged 102, against 95 and 111 in the two preceding months. Diphtheria was rather more prevalent than it had been in other recent months; among the various metropolitan boroughs the greatest proportional prevalence of this disease was recorded in St. Pancras, Shoreditch, Bethnal Green, Poplar, Southwark, Bermondsey, Lambeth, and Deptford. The number of patients under treatment for diphtheria in the Metropolitan Asylums Hospitals at the end of March was 1367, against 1420 and 1453 at the end of the two preceding months; the weekly admissions averaged 161, against 168 and 165 in the two preceding months. Enteric fever also was rather more prevalent than in the three preceding months; of the 39 cases notified during the month, 7 belonged to Stepney, 7 to Poplar, 3 to Camberwell, and 2 each to Chelsea, Islington, Bethnal Green, Lambeth, Greenwich, Lewisham, and Woolwich. There were 29 cases of enteric fever in the Metropolitan Asylums Hospitals at the end of March, against 35 and 29 at the end of the two preceding months; the weekly admissions averaged 6, against 6 and 4 in the two preceding months. Erysipelas was proportionally most prevalent in St. Marylebone, Finsbury, Poplar, Southwark, and Deptford. The 58 cases of cerebro-spinal meningitis included 7 in Camberwell, 5 in Southwark, 5 in Lambeth, and 4 each in Fulham, Hackney, Battersea, and Wandsworth; the 5 cases of poliomyelitis belonged respectively to Hammersmith, Stepney, Wandsworth, Camberwell, and Woolwich. The 22 cases of puerperal fever notified during the month included 5 in Lambeth, 3 in Islington, 3 in Hackney, and 2 in Southwark.

The mortality statistics relate to the deaths of persons actually belonging to the several metropolitan boroughs, the deaths occurring in institutions having been distributed among the several boroughs in which the deceased persons had previously resided. During the four weeks ending March 31st the deaths of 6042 London residents were registered, equal to an annual rate of 18·3 per 1000; in the three preceding months the rates were 22·6, 18·4, and 21·3 per 1000. The death-rates in March ranged from 11·8 in Hampstead, 12·7 in the City of London, 12·9 in Lewisham, 15·8 in Woolwich, 16·4 in Bethnal Green, and 16·5 in Kensington, to 20·3 in St. Marylebone, 20·4 in St. Pancras, 20·9 in Poplar, 22·1 in Southwark, 22·7 in Greenwich, 23·2 in Chelsea, and 23·6 in Bermondsey. The 6042 deaths from all causes included 511 which were referred to the principal infectious diseases; of these, 340 resulted from measles, 7 from scarlet fever, 56 from diphtheria, 38 from whooping-cough, 3 from enteric fever, and 67 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded during the month in the City of London or in Stoke Newington; among the other boroughs they caused the lowest death-rates in Hammersmith, Hampstead, Hackney, and Deptford and the highest rates in Paddington, Fulham, St. Pancras, Holborn, Bermondsey, Battersea, and Wandsworth. The 340 deaths from measles were 127 in excess of the corrected average number in the corresponding period of the five preceding years; this disease was proportionally most fatal in Fulham, St. Marylebone, Holborn, Bermondsey, Battersea, and Wandsworth. The 7 fatal cases of scarlet fever were 11 below the corrected average number, and belonged respectively to the City of Westminster, St. Pancras, Stepney, Southwark, Lambeth, Battersea, and Wandsworth. The 56 deaths from diphtheria exceeded by 10 the corrected average number; this disease showed the highest proportional mortality in Paddington, Shoreditch, Bethnal Green, Poplar, Lambeth, and Greenwich. The 38 deaths from whooping-cough were 85 below the corrected average, the highest death-rates being recorded in Paddington, St. Marylebone, and Southwark. The 3 fatal cases of enteric fever were equal to half the corrected average, and belonged respectively to Finsbury, Wandsworth, and Woolwich. The 67 deaths from diarrhœa and enteritis among children under 2 years of age were 18 below the corrected average; the mortality from this cause was proportionally greatest in Paddington, Fulham, St. Marylebone, Poplar, and Southwark. In conclusion, it may be stated that the aggregate mortality in London during March from these principal infectious diseases was 4·1 per cent. above the average.

THE death is announced of Mr. Arthur James, who, in addition to his other charitable actions, gave the income of £20 000 to the Middlesex Hospital for the purpose of cancer research.

CENTRAL MIDWIVES BOARD.—A special meeting of the Central Midwives Board was held at Queen Anne's Gate Buildings, Westminster, on April 20th, with Sir Francis H. Champneys in the chair. A number of midwives were struck off the Roll, the following charges, amongst others, having been brought forward:—

Being in attendance at a confinement and the patient suffering from excessive bleeding, the midwife did not immediately explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 20 (3) Old Rules, and E. 20 and 21 (3) New Rules, and the patient being in the condition aforesaid the midwife did not hand to the husband or the nearest relative or friend present the form of sending for medical help, properly filled up and signed by her, in order that this might be immediately forwarded to the medical practitioner, as required by Rule E. 19 Old Rules, and E. 20 New Rules. The midwife did not take and record the pulse and temperature of her patients at each visit as required by Rule E. 14, did not enter her records of pulse and temperature in a note-book or on a chart carefully preserved as required by Rule E. 14, and she did not keep her register of cases as required by Rule E. 24. Not being scrupulously clean in every way, as required by Rule E. 2 and when called to a confinement the midwife did not take with her the appliances and antiseptics as required by Rule E. 3. In contravention of Rule E. 18 a midwife laid out the dead body of a person not being a patient upon whom she had been in attendance at the time of death, and having laid out such dead body for burial she failed to notify the local supervising authority thereof as required by Rule E. 22 (1) (d), and failed to undergo adequate cleansing and disinfection to the satisfaction of the local supervising authority, as required by Rule E 18 and 6. The midwife neglecting to cleanse the eyelids of a child at birth, as required by Rule E. 16. When attending a patient the midwife did not on each occasion wear a clean dress of washable material as required by Rule E. 2, and was not scrupulously clean in every way, as required by Rule E. 1

Correspondence.

"Audi alteram partem."

TUBERCULOSIS AND THE WAR.

To the Editor of THE LANCET.

SIR,—I agree with Dr. H. A. Ellis in protesting against the use of the term "permanently cured" as applied to pulmonary tuberculosis. "Arrested" is, I think, the proper term, as there is always the danger of a lowered vitality causing the reappearance of all symptoms. One of the big curses of pension committees to-day is the question of those known treated consumptives who have been taken into the Army during the past 30 months under the medical delusion that they had either no disease or were "permanently cured."

I am afraid that the same danger is present to-day. In the re-examination of exempted men there is the danger of these broken-down men being re-netted. The examination will not be made by tuberculosis specialists, but by all-round men. I wish to emphasise that no old consumptive case should be enlisted. Looking over a register of nearly 4000 cases, I find that of the many enlisted, practically all have returned with breakdowns, sometimes after Gallipoli and years in France, but broken-down and requiring treatment. It is false economy to take these men. They can often carry on at their own automatic work, and even if they keep up until sent on active service, then T. bacilli reappear in their sputum when they cannot carry out preventive measures and they become a danger to the others in the hut, billet, or sleeping place.

Army Council Instructions (No. 908 of 1916) state that every recruit must be asked: (1) Whether he has been in a sanatorium; and (2) whether he has been notified to any health authority as tuberculous. If his answer in the affirmative is confirmed he should be rejected. I think that every tuberculosis officer should see that this Order is carried out in deed in his district.

I am, Sir, yours faithfully,

Swansea, April 17th, 1917. FRANK CLIFFORD.

To the Editor of THE LANCET.

SIR,—The letter of Dr. Henry A. Ellis appearing in your issue of April 14th gives abundant confirmation of my contention that a tuberculosis dispensary may act as a very efficient sieve for preventing the treatment of pulmonary tuberculosis until it has become chronic. His letter reminds me of nothing so much as the directions given to a dispenser when making up a mixture containing two incompatibles, he is directed to place the incompatibles as far from one another as possible. At the beginning of his letter he seems to infer that it is impossible to cure pulmonary tuberculosis permanently, and at the end he tells us that cases suitable for sanatorium treatment are those where "the lesion has usually become more definite and permanent tissue destruction has occurred, as is demonstrated by the physical signs of the grosser nature, easily recognised by the ordinary stethoscope." Herein lies the whole crux of the problem. Why are such patients allowed to continue their work and visit dispensaries, when they should be in bed at home under the care of their own doctor, a course which would undoubtedly be the most efficient means of preventing destruction of lung, and if they do not improve rapidly they should be sent forthwith to a properly conducted sanatorium without running the risk of attending a dispensary. The necessity of the treatment or otherwise of early cases by rest in bed or at a sanatorium depends upon the occurrence or not of symptoms indicative of active disease, apart altogether from the presence or absence of physical signs.

I do not understand in what way the cases of the two soldiers mentioned by Dr. Ellis are relevant in this connexion; nor do I see any reason, as they appear to be permanently cured, why they should receive any treatment either at a sanatorium or at a dispensary. I would suggest that they return to ordinary civil life. I have had two similar cases of men returned from the front, neither of which has been treated at a sanatorium or dispensary. They were cured before being discharged from the Army, having had the good luck to be put to bed during an acute attack, in which, fortunately for them, tubercle bacilli were found in their sputum in France. But for this timely accident their illness would no doubt have been called trench fever, and they would have run the risk of acquiring that sufficient amount of destruction of lung which appears to make patients eligible for treatment in a sanatorium.

It should be known by all medical men, now, that the making of a chronic follows surely from allowing cases with low degrees of activity to continue to walk about and work when they should be in bed. No one suggests that patients with any other serious disease should continue to be wage-earners. One can no more tell whether a person is permanently cured of tuberculosis than one can state that an apparently healthy person will not develop tuberculosis. Unfortunately, owing to our present methods, we know that a good many cases returned as well and working in sanatorium reports are not cured, largely owing to delay in diagnosis, with the consequent absence of efficient treatment, which is considered unnecessary until either tubercle bacilli are found in the sputum or gross lesions are discernible by means of the stethoscope.

I am, Sir, yours faithfully,

Ayrshire Sanatorium, April 15th, 1917. EDWARD E. PRESS.

THE TECHNIQUE OF LUMBAR PUNCTURE.

To the Editor of THE LANCET.

SIR,—In reference to the remarks on this subject by Dr. T. J. Horder in your issue of April 28th, I would remark that when it is supposed that the needle is blocked by a constituent of the cauda equina or other tissue, besides pushing in and withdrawing the needle a little, the further device of revolving it on its own axis is often successful. This is only what might be expected, as the aperture at the point opens more or less sideways according to the angle at which the point is made. When, again, a long needle is used for a small patient and it droops by its own weight after entering the pia-arachnoid space, a flow may frequently be established by supporting the head of the needle and so preventing the hole at the point pressing against tissue and being blocked.

In reference to being in the position of wanting a specimen free of blood, and having been unlucky enough to prick a vein, I have found it often succeed to puncture in another space. It should be remembered that it is equally safe to puncture in the second and third lumbar spaces as well as in the fourth. This manœuvre is also useful when a dry puncture unaccountably occurs and the devices recommended have failed. Again, in the cadaver, when there is no flow and a specimen is required, it is useful to insert two needles, one in the fifth or fourth space, and the other as high up as the first space if entry is possible, and then pass normal saline through from one to the other.

The following contretemps has occurred to me three times, twice in young patients and once in an adult. The needle has progressed forwards much farther than usual through soft tissue beyond the spinal cavity, a flow only being obtained by withdrawing, say one-third to half an inch. I have accounted for it by supposing that the needle has punctured an intervertebral disc, or that the back wall has been abnormally deficient. Perhaps Dr. Horder or others would give us any similar experience they may have encountered? I am, Sir, yours faithfully,

Ingatestone, April 29th, 1917. SHEFFIELD NEAVE.

THE LUMLEIAN LECTURES ON HEART DISEASE.

To the Editor of THE LANCET.

SIR,—The infective aspect of much of heart disease is of such great importance that it would seem right that the State should establish clinics all over the country to deal with rheumatism and its congeners. This would enable, by giving facilities for early diagnosis by trained physicians, much of the mental and physical loss to the country owing to such infections to be saved, and would also serve as a means of impressing on the general medical practitioner the importance of careful and early diagnosis of such nationally harmful conditions as would be dealt with in such clinics as I have suggested. Dr. F. J. Poynton's letter in THE LANCET

of April 14th should be read and digested and its questions carefully discussed by all practitioners whose minds are above mere therapeutics and who have not only the individual but the communal interests at heart. Such clinics would serve also as a source of material for associated research, especially if properly organised research hospitals were instituted, to be directed by the heads of these clinics.

I am, Sir, yours faithfully,

Beeston, Notts, April 22nd, 1917. H. GEORGE P. CASTELLAIN.

THE AGGLUTINATION CURVE AND ITS IMPORTANCE.

To the Editor of THE LANCET.

SIR,—In THE LANCET of March 10th Major G. Dreyer and Captain A. C. Inman make a contribution to this subject, in which they take exception to the "conclusion" arrived at by Lieutenant-Colonel C. J. Martin and Major W. G. D Upjohn, that after triple inoculation (T., A, B) "the interpretation of observations upon the agglutination of enteric organisms will ..... be too difficult to possess any practical value, and the isolation of the infecting organism must be resorted to for diagnosis." Martin and Upjohn's statement can, however, hardly be regarded as a conclusion in the sense that it was their carefully-considered opinion, based on ascertained facts, for at the time they made it no facts relating to the behaviour of agglutinins in enteric fevers occurring in triple-inoculated patients were available. The statement was more in the nature of a prophecy.

Captain E. W. Ainley Walker, in an article in THE LANCET of Nov. 25th, 1916, publishes some cases which, in my opinion, are good illustrations of the difficulty anticipated by Martin and Upjohn. Yet, curiously enough, Captain Walker appears to be entirely unconscious of any difficulty in interpreting his results. On the contrary, he attaches diagnoses which, I venture to suggest, no experienced physician would accept. And, after quoting Martin and Upjohn, he concludes that the difficulty "lies rather in persuading some observers to employ methods which have any practical value in inoculated patients." He refers, of course, to Dreyer's method, in the employment of which, he informs us, no difficulty at all is likely to be met with in the diagnosis and differentiation of the enteric fevers in inoculated patients.

Although Dreyer and Inman's article appears also to be published with the intention of disproving Martin and Upjohn's "conclusion," it does not contain a single relevant fact. Of the 11 cases published, not one had been inoculated with triple vaccine. Nine of the cases were paratyphoid A and B fevers in T.-inoculated patients. It these cases the exact methods referred to by Dreyer and Inman are not strictly necessary in routine work. In a T-inoculated patient suffering from an illness which presents the clinical features of "enterica" one agglutination test indicating the presence of A or B agglutinins (usually in addition to T.-inoculation agglutinin) is sufficient for a diagnosis of paratyphoid A or B fever respectively. It is true that by using a strictly quantitative technique, and repeating the estimations of agglutinin at intervals of a few days throughout the disease, the diagnosis is rendered more certain, and it is possible in this way to discriminate in many cases, without reference to the clinical facts of the case, between a present and a past infection. But in busy routine work, such refinements are impossible, and, in fact, quite unnecessary. One "positive" result when interpreted by the physician in conjunction with the clinical facts of the case, leads to a correct diagnosis in the great majority of cases.

The exact methods are necessary only in the diagnosis of an infection against which the patient has been inoculated—that is, T. infections in T. inoculated patients (e.g., Cases 10 and 11 of Dreyer and Inman's article), and all "enterica" patients who have had a triple (T., A, B) inoculation (e g., Cases 3, 6, 9, 10, 12, and 13 of Captain Walker's article). In T., A, B inoculated cases the agglutinin response does not confine itself to the homologous agglutinin, but may effect to an equal or even to a more marked extent one or other or both of the heterologous agglutinins. And it is not yet known to what extent other infections having no relation to the enteric group may stimulate T.A.B. inoculation agglutinins. Under these circumstances Martin and Upjohn's prophecy may contain a good deal of truth.

My own experience, up to date, with triple-inoculated patients is that a diagnosis can be made in many cases—but in some cases results are obtained which baffle interpretation. I feel, however, that this difficulty in interpretation of results would disappear if Captain Ainley Walker would kindly explain why Case 10 of his article of Nov. 25th, 1916, is "clearly a case of paratyphoid B infection."

I am, Sir, yours faithfully,

R. P. GARROW,

Egypt, March 25th, 1917. Captain, R.A.M.C.

THE EXAMINATION OF THE BLOOD OF TYPHUS FEVER CASES BY DARK GROUND ILLUMINATION.

To the Editor of THE LANCET.

SIR,—The description by Dr. W. J. Wilson and Dr. Georgina R. Darling in your issue of April 14th of the spirochæte-like bodies which they have found in the blood of typhus fever cases very strongly resembles that of the bodies with which all dark-ground workers must be familiar in specimens which contain much blood. These show all gradations from a pale, waving thread to one which is broken up by a series of highly refractile dots or minute circles, a common form being a filament with a granule at each end. The threads are apparently motile, with a wriggling motion by which they travel across the field, and they vary in length from 4μ to 20μ, or longer. Sometimes the thread is interrupted in its middle by an oval or circular body, which is about one-third the size of a red blood cell.

I am afraid that I have now damped the hopes of many workers who have adopted the dark-ground method in their search for undiscovered infective agents and have seen in these bodies the possible goal of their researches. For want of a better name I have privately called them "streamers," and they seem to be more abundant in specimens taken from anæmic patients. At one time I thought they were derived from red blood cells, since it is a common event to see in such specimens numbers of red cells with "streamers" attached all round them like fringes, as if the cell membrane had become very ragged. Captain D. Thomson, however, showed me a specimen which he had stained by Leishman's method, and the threads had taken the chromatin stain of nuclei. I am, Sir, yours faithfully,

L. W. HARRISON,

Lieutenant-Colonel, R.A.M.C.

Military Hospital, Rochester Row, S.W., April 29th, 1917.

MODIFIED TETANUS.

To the Editor of THE LANCET.

SIR,—I read with much interest Captain H. Burrows's article on modified tetanus in THE LANCET of Jan. 27th, as at the time it reached me I had an example of that condition under my care.

The patient, a naval officer on a gunboat, was wounded in the right buttock on Feb. 26th by a machine-gun bullet. Hæmorrhage was severe at the time, but was controlled by packing with gauze soaked in Friar's balsam. No antitetanic serum was given. My attention was called to him six days later as twitching had been noticed in the neighbourhood of the wound. He then had clonic contractions of the muscles around the wound, particularly the gluteus maximus; these spasms recurred every few minutes and were very painful and sudden in onset, causing a fleeting contraction of the whole musculature not unlike a tetanic spasm, but unassociated with trismus, dysphagia, or other signs of generalised tetanus. An intramuscular injection of 1500 units of antitetanic serum was immediately given, and shortly afterwards the patient was removed to the theatre, the wound freely opened and counterdrained, and 1500 units injected into the theca. Occasional local spasms occurred throughout the day with lessening frequency, and the patient complained of a feeling of stiffness around the wound. Further intramuscular injections of 1500 units were given the same evening and on the following day. No further spasms occurred, and at the time of writing this, 10 days later, the danger of tetanus is apparently past, but a gas-producing spore-forming organism has been isolated from the wound, which is still septic, while the general condition of the patient is satisfactory.

The chief clinical feature associated with this case was the severe pain elicited by the clonic contractions of the affected muscles; no sensory changes of any sort appear to have been present.—I am, Sir, yours faithfully,

R. J. MCNEILL LOVE,

Captain, R.A.M.C.

At a British General Hospital, Mesopotamia Expeditionary Force, March 14th, 1917.

THE HANBURY MEDAL.—The Hanbury medal, which is awarded biennially for research in the chemistry and natural history of drugs, has been adjudicated to Professor H. G. Greenish, Dean of the School of the Pharmaceutical Society of Great Britain.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed.

Capt. J. E. Black, M.C., R.A.M.C., attached Bedford Regiment, qualified at Glasgow in 1911 and was promoted Captain in October, 1914. The award of the Military Cross was announced in THE LANCET of Nov. 18th, 1916, p. 881.

Lieut.-Col. D. B. Chiles-Evans, D.S.O., R.A.M.C., was educated at University College, Cardiff, and at University College, London, and qualified in 1903. He held the appointment of house surgeon at the Bridgwater Infirmary and joined up at the beginning of the war, at which time he was in practice at Swansea and was assistant medical officer of the Swansea Union and Captain, R.A.M.C., in the 3rd Welsh Field Ambulance, T.F. The award of the D.S.O. was announced in THE LANCET of June 10th, 1916, p. 1195.

Capt. T. Welsh, M.C., South African Medical Corps, was educated at Edinburgh University and qualified in 1910. He held appointments at the Ramsgate General Hospital and at the Royal Infirmary, Edinburgh, and later went to South Africa as medical officer at the Knight Central Mines, Johannesburg. Soon after the outbreak of war he joined the South African Medical Corps, and was awarded the Military Cross in January this year (announced in THE LANCET, Jan. 20, p. 125).

Capt. H. J. Cotter, R.A.M.C., qualified in Ireland at the close of the year 1914, and thereupon joined the R.A.M.C.

Capt. E. J. Blair, R.A M.C., attached Cyclist Battalion, was educated at Edinburgh University, and qualified in 1914. After joining up he was attached for a time to the 5th Battalion Royal Scots.

Capt. L. B. Baird, R.A.M.C., was educated at Manchester University and at the London University, and qualified in 1914. He joined the R.A.M.C. on the outbreak of hostilities and went through the Gallipoli campaign.

Capt. G. D. Ferguson, D.S.O., R.A.M.C., attached Royal Field Artillery, qualified at Edinburgh in 1913. On the outbreak of war he joined the R.A.M.C., and was promoted Captain in August, 1915. He gained the D.S.O. for tending the wounded, of whom he brought in over 50, under very heavy fire (THE LANCET, Nov. 18th, 1916, p. 880).

Capt. R. Home, R.A.M.C., received his medical education at the University of Toronto, and qualified in 1913. He came over with the Canadian Expeditionary Force.

Died.

Col. J. H. E. Austin, A.M.S., was a student at St. George's Hospital, London, and qualified in 1887. He saw service in the Nile Expedition and the South African War, and was the recipient of the Egyptian medal and of the Queen's and King's medal with five clasps. He died at a military hospital in London.

Missing, believed Drowned.

Lieut. I. R. R. Brogden, R.A.M.C., was educated at Ipswich School and at Cambridge, and made his professional studies at Guy's Hospital, London. He qualified in 1916, whereupon he joined the R.A.M.C., and was given six months' leave to act as house surgeon at Guy's Hospital. Later he was posted to Blackpool, and then proceeded to Egypt.

Wounded.

Capt. J. Walker, R.A.M.C., attached Hampshire Regiment.
Major O. L. Appleton, R.A.M.C.
Capt. J. W. Burton, R.A.M.C., attached Royal Scots.
Major A. H. Palmer, R.A.M.C., attached Yeomanry.
Capt. J. P. S. Cathcart, Canadian A.M.C.
Capt. N. Macleod, R.A.M.C., attached H.A.C.
Capt. A. Budd, R.A.M.C., attached Royal Warwickshire Regt.
Capt. A. G. Troup, R.A.M.C., attached London Regiment.
Capt. R. H. Wilson, R.A.M.C., attached R.F.A.
Capt. G. B. Lowe, Australian A.M.C.
Capt. M. Brennan, R.A.M.C., attached Royal West Kent Regt.
Capt. G. H. Kearney, R.A.M.C., attached R.F.A.
Capt. K. P. MacKenzie, R.A.M.C., attached R.E.

Erratum.—By a confusion, which we regret, arising from the identity of initials, the Dr. H. G. Smith who is reported as missing, believed drowned, in the sinking of the hospital ship *Salta*, is Dr. H. G. Smith, of Carnforth, Lancashire, and not Dr. H. G. Smith, lately of Croydon and now in France, as stated in our issue of April 21st, p. 629.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war :—

Major R. N. Macpherson, Indian Infantry, youngest son of the late Brigade Surgeon Lieut.-Col. R. N. Macpherson, A.M.S.

W. R. Erskine, Canadian Contingent, only son of the late Dr. W. Erskine, of Sydenham, Kent.

Second Lieut. H. D. Carless, Gordon Highlanders, younger and only remaining son of Lieut.-Col. A. Carless, R.A.M.C., of Upper Wimpole-street, London.

Capt. B. J. A. Fawcett, East Lancashire Regiment, younger son of Lieut.-Col. E. Fawcett, I.M.S. (retired), of Blackheath, London.

Lieut.-Commander W. W. Hallwright, D.S.O., R.N., youngest son of Mr. M. Hallwright, M.R.C.S., of Edgbaston, Birmingham.

Capt. L. B. Baird, R.A.M.C., elder son of Dr. W. J. Baird, of Bury, Lancs.

Second Lieut. K. I. Mackenzie, Argyll and Sutherland Highlanders, attached Royal Flying Corps, youngest son of Dr. I. Mackenzie, of Ryde, Isle of Wight.

Private M. T. Myles, Canadian Infantry, youngest son of Major E. H. Myles, R.A.M.C., of Nottingham.

Lieut. J. G. Will, Royal Flying Corps, second son of Dr. J. K. Will, of Bethnall House Asylum, London.

Capt. H. G. Smith, R.A.M.C., son of the late Dr. J. Smith, LL.D., a former President of the Royal College of Surgeons of Edinburgh.

Second Lieut. F. C. Coleman, Norfolk Regiment, only child of Dr. P. Coleman, of Clacton-on-Sea, Essex.

THE HONOURS LIST.

The particulars of the gallant deed for which the *Distinguished Service Order* was conferred upon Capt. Allan Watson, R.A.M.C. (announced in our issue of March 24th, p. 468), is now published :—

For conspicuous gallantry and devotion to duty. He went forward under very heavy fire, before his own unit was ordered to advance, and commenced to dress the wounded of another battalion. He worked untiringly under fire both day and night, never resting until all the wounded had been brought in.

The following further awards to medical officers are announced :—

Military Cross.

Capt. John Hardie, Australian Army Medical Corps.

For conspicuous gallantry and devotion to duty. He attended a large number of wounded at the aid post under heavy fire and continued at work after being wounded himself in two places. He set a fine example throughout.

Temp. Lieut. Erach Ruttonji Daboo, I.M.S.

For distinguished service in the field in Mesopotamia.

THE UNITED STATES AND THE WAR.

The American Doctor and the State of War.—Dr. Mahlon Ashford, Captain in the United States Army Medical Corps, discusses in a recent issue of the *New York Medical Journal* the rôle which the American civilian doctor must play "in the great drama of national military preparedness," it being clear that an efficient medical department is a vital military factor for success. The article is of interest to our civil practitioners, so many of whom have undergone, or are about to undergo, similar experiences. The civil practitioner in the vast majority of instances, when he has to leave his present environment for a new one, has to live under conditions totally at variance with former experience, and to treat his sick and wounded under new and difficult conditions of life. Dr. Ashford points out to his American colleagues that if the military doctor fails to respond adequately in the duties imposed upon him, by so much he renders his department inefficient, and if the failure is shared by a very large number of officers the department will break down. "Many an American doctor exclaims," says the author, "'I am ready to serve my country. I am a good surgeon, but I can't bother with red tape.'" To this he replies that the regular Army, and doubtless the Navy, is more than willing to dispense with red tape, but that just as businesses require systematised administration so do Government departments, adding: "If reserve officers suddenly thrown into military life would devote to a study of our business system a moiety of the time they spend cursing our red tape, their service would be happier to themselves and others, and the language would be much poorer in expletive."

Medical Mobilisation: an American View of our Efforts.—The (American) Auxiliary Medical Committee for National Defence has appointed a committee to study the arrangements in England and France under which the practices of doctors entering the services are taken over by those remaining at home to be subsequently returned to their owners. An editorial article in the *New York Medical Journal*, after quoting from THE LANCET of Oct. 28th last an analysis of the causes which prevent the pressure of work of medical men at home being as great as might be expected, adds: "Undoubtedly, if the American practitioner is called upon to face a similar situation, the well-known Yankee ingenuity will come to the fore and suggest many ways of alleviating the pressure. In the meantime, it will be interesting to observe just what will be the ultimate solution which our British cousins will find for their present quandary." We, too, shall watch with interest how America has profited by our example.

Universities and Medical Schools: Organisation of Hospitals.—Nearly 500 Harvard men have so far taken part in the European War: among them being 186 members of the American Ambulance, 95 in the Harvard Surgical Unit, and 15 engaged in other spheres of medical work. The Johns Hopkins Medical School is now organising a base hospital unit to consist of some 300 of its own graduates and students. The Roosevelt Hospital is staffing a Red Cross Base Hospital Unit of 500 beds, under the direction of Dr. Charles H. Peck, who will be assisted by Dr. James I. Russell and Dr. Rolfe Floyd.

Treatment of Tuberculous Soldiers.—The National Association for the Study and Prevention of Tuberculosis has appointed a Commission to consider the existing facilities for the care of soldiers, prisoners, and others, and to take precautionary measures for the prevention of the spread of the disease to the troops. Dr. Herman H. Biggs, the New York State Commissioner of Health, who has been studying the question of tuberculosis and its consequences in the French Army at the request of the French Government, has been appointed chairman of the Commission.

America, it is announced, will send 1000 surgeons to Europe.

Seventy American voluntary Red Cross workers have arrived at Bordeaux from New York.

THE POST OFFICE AND THE WAR.

The Postmaster-General's Report for the year 1915–16 indicates that his gigantic department, in addition to its previously existing functions, has become an immense bureau of the affairs of war. For instance, we find that by Nov. 1st, 1916, 68,000 of the staff had already joined the colours and the military authorities had been informed that 7000 more would be liberated when required By the same date the additional female staff totalled 35,000. In fact, the number who did not enrol under the Derby scheme was quite microscopic. The 1st Battalion of the Post Office Rifles, whose three battalions are recruited from Post Office servants, has been at the front since the early spring of 1915 and has achieved distinction in many engagements. While the entire personnel of the Army Post Office has been supplied by the Post Office staff in addition large numbers have joined the signal companies (R.E.) and the Naval Signal Units. By the end of the year 1915 over 300 Post Office medical officers had received commissions. A long list of honours, including two V.C.'s, has been won.

In October, 1914, the Post Office undertook the payment of separation allowances, which duty now involves the distribution of approximately £2,200,000 weekly to some 2,700,000 persons, whilst during the year ending March 31st, 1916, upwards of 100 million payments were made, representing a total sum disbursed of about £80,000,000; while the part which it has played in collecting subscriptions to the various forms of War Loan can only be described in figures too big to be realisable. The Post Office collects the correspondence for the troops, which equals approximately 11,000,000 letters and 875,000 parcels weekly, and hands them over to the Home Depôt of the Army Post Office in London for transmission abroad, whilst it also, of course, receives and distributes the whole of the incoming mails from the troops. In March, 1916, parcels to the number of an average of 82,200 per week were dispatched to British prisoners of war abroad, whilst approximately 15,000 per week were received, principally from Germany, for prisoners of war in this country. The telephonic and telegraphic business of the war, proportionately as large as the postal work proper, is also directed by the Post Office.

The last report of the Postmaster-General reveals how potent a force in the life to-day of this country the Post Office is, and its vast activities may be accepted as evidence that the bodily and mental physique of the active personnel must be of a high order, and that the efficiency of the medical officers of the Post Office bears increasingly good fruit.

AUXILIARY R.A.M.C. FUNDS.

Lieutenant-Colonel F. W. H. Davie-Harris, secretary of the Auxiliary R.A.M.C. Funds, 124, Victoria-street, S.W., sends us a list of donations, totalling £676 9*s.* 6*d.*, received on account of the Officers' Benevolent Branch for the quarter ending March 31st. The first list appeared in THE LANCET of Feb. 10th, p. 243.

	£	s.	d.
Alexander, Capt. W. A.	1	1	0
Barclay, Capt. A. E.	5	5	0
Balkwell, Capt. F.	10	10	0
Ballance, Col. C. A., C.B., M.V.O.	5	0	0
Brownson, Capt. R. O.	1	1	0
Baldwin, Lieut. E.	1	1	0
Birr Training Centre, Officers' Mess	50	0	0
Broadbent, Capt. Sir J.	10	0	0
Clark, Col. A. V.	5	5	0
Carter, Capt. B.	1	0	0
Cheyne, Lieut.-Col. Sir W.	21	0	0
Crawford, Lieut. J. P.	1	1	0
Crawford, Capt. J. J.	1	1	0
Cummins, Lieut. M. M.	1	1	0
Douglas, Dr. J., New York (per Sir W. Osler)	100	0	0
Duke, Dr C.	5	0	0
Dowler, Mr. H. M.	1	0	0
Ellis Capt. R.	5	5	0
Eadie, Lieut. R. B.	1	1	0
Footner, Mr. G. R.	25	0	0
Fawcett, Capt. J.	4	4	0
Godlee, Sir R.	6	6	0
Hill, Capt. J.	1	1	0
Hutchinson, Lieut. T. P.	1	1	0
Hendry, Capt. J.	1	1	0
Irving, Capt. C.	1	1	0
Johnson, Rev A. H. (per Lieut.-Col. Collier)	2	12	6
Knaggs, Maj. R. L.	10	0	0
Kirton, Capt. J.	1	1	0
Longley, Capt. W.	2	2	0
Littlewood, Lieut.-Col. H.	25	0	0
Lewis, Capt. L. A.	1	1	0
Lones, Capt. P. E.	1	1	0
Lichfield Officers, R.A.M.C.	10	10	0
Leake, Maj. A. M., V.C.	5	5	0
Leachy, Rev. A. E. B.	1	0	0
Mackay, Lieut. A. C.	1	0	0
Minch, Capt. J. B.	1	1	0
McArthur Capt. G. A. D.	1	1	0
Mullan, Capt. R. F.	1	1	0
Moone, Capt. P. W.	1	1	0
3rd Northern Gen. Hosp. Officers	48	6	0
Per Sir W. Osler	62	0	0
O'Regan, Lieut. F. W.	1	1	0
Pigot, Capt.	1	0	0
Polter, Capt. J.	1	1	0
Pemberton, Lieut.-Col. R., I.M.S.	5	5	0
Pickering, Maj. H. F.	5	0	0
Ripon Training Centre Officers' Mess	180	0	0
P. D. H. S.	5	5	0
Stewart, Dr. J., Leeds	5	0	0
Telling, Maj. W. S., Leeds	2	2	0
Walker, Capt. J. H.	21	0	0
Waddington, Capt., R.A.M.C.	1	0	0
Williams-n, Capt. H.	2	2	0
Wood, Dr. F. H. (per Lieut.-Col. Collier)	5	5	0

ADMINISTRATIVE REFORM IN MESOPOTAMIA.

Mr. Austen Chamberlain has received from Sir Arthur Lawley, the Chief Commissioner of the British Red Cross and Order of St. John in Mesopotamia, a most comforting report of medical and sanitary administration in a zone of the war where our arms previously suffered terrible reverses and our soldiers untold miseries through defects which are now remedied. Nothing, we presume, but the magnitude of our imperial endeavours has allowed the official shortcomings, which marked the first stages of the war in Mesopotamia, to go unaccounted for; it is obvious that the authorities at that time had neither accurate information, reasonable judgment, or any imagination. Sir Arthur Lawley has now gone closely into the general organisation and detailed activities designed to provide adequate welfare for the troops in Mesopotamia, especially for the sick and wounded, and is able to report that we may look forward with perfect confidence to the precautions that have been taken. "The days of muddle," he says, "are ended and order has been evolved out of chaos." Sanitation has been taken in hand, the feeding of the troops from the firing-line to the base is excellent, and rapid evacuation of the wounded from the fighting zone is assured. We have ourselves received, under the same date as that of Sir Arthur Lawley's report, an exact confirmation of his words, though the position of our correspondent prohibits us from publishing his letter. When we remember the difficulties attending a military campaign in such an environment—the heat and the rain, the floods and the flies, the dearth of roads and the abundance of swamps—we have reason to be proud of the determination which has met all these obstacles grimly and has overcome them surely.

A DUBLIN HOSPITAL FOR FRANCE.—A Dublin correspondent writes: Within the past week or two arrangements have been concluded between the War Office and the medical staffs of the Dublin hospitals by which the latter engage to supply the staff of a base hospital in France for at least a year. The selection of the staff has been in the hands of the Presidents of the Royal College of Physicians and of the Royal College of Surgeons, and the services of practically all the hospital physicians and surgeons of Dublin have been at their disposal. Each medical man who is accepted must engage to serve at least three months in France, and he will be given a temporary commission in the Royal Army Medical Corps. The senior surgeon and senior physician will rank as lieutenant-colonels, the other surgeons and physicians as majors, while, doubtless for some good reason for the difference, the specialists—pathologists, ophthalmologists, anæsthetists, and radiographers—will rank as captains. The entire staff will consist at a time of three surgeons, two physicians, and four specialists. The War Office declines to accept any medical man who is under 40 years of age, or, on the other hand, anyone who is "much over 50." The latter exclusion has debarred several active surgeons and physicians, and has evoked some comment in view of the fact that many medical men well past 50 are employed not merely in France but in much more unhealthy climates. If, however, the War Office is in such urgent straits for medical men as its recent actions would imply, it may be ready in a few months to accept competent surgeons who are still physically sound, even if they be past 55. It is worth recalling that a hospital staff such as is now accepted by the War Office was refused on more than one previous occasion when offered by Dublin, and also when offered by Belfast in 1915, and by Cork more recently.

QUININE, PHENACETIN, AND FORMALDEHYDE.—The Army Council are about to take stock of all quinine salts as well as of phenacetin and formaldehyde, with a view of reserving them for army use. All persons holding stocks are to furnish particulars on a form provided by the Director of Army Contracts if the amount exceeds in the case of quinine sulphate 100 oz., of the bi-sulphate 25 oz., of the hydrochloride 25 oz., of the bi-hydrochloride 25 oz ,of phenacetin 7 lb., and of formaldehyde (40 per cent.) 10 gallons. In the case of stock exceeding the above quantities a return must be made forthwith, and the excess balance held at the disposal of the War Office.

BRITISH UNIVERSITIES AND THE WAR.—An interesting pamphlet has been issued by the *Field and Queen* (Horace Cox, Limited, Bream's-buildings, E.C.), recording the part played up to date by the Universities of the United Kingdom in the war. The activities of our various Universities are detailed by their respective vice-chancellors, principals, and presidents, or by someone thoroughly representative of the governing body, and in this way an accurate and succinct statement has been secured. The book was compiled at the request of correspondents in the United States, and is prefaced by a brief introduction from the pen of Mr. H. A L. Fisher, President of the Board of Education, and closed by an essay from Sir Theodore Cook on the Universities of the United States and of Great Britain, dealing largely with athletic exploits.

WINDLESHAM MILITARY HOSPITAL.—The second report of this hospital, No. 16 Surrey V.A.D. British Red Cross Society, states that 739 cases have been admitted and 117 operations performed since its opening in June, 1915. The original arrangement was for 30 beds, but in response to the request of the Aldershot authorities the accommodation has been increased to 50 beds. The hospital is auxiliary to the Cambridge Hospital at Aldershot and to the Connaught. Consequent upon the formation of camps for a portion of the Canadian forces engaged in the neighbourhood as lumbermen in felling and sawing timber, the Canadian medical authorities requested permission to utilise the hospital, and a considerable number of injuries received in this way have been treated

MEDICAL MEN IN IRELAND AND MILITARY SERVICE.—An Irish correspondent writes: At the meeting of the Council of the Irish Medical Association held on April 19th resolutions (see THE LANCET, April 28th, p. 666) were passed calling attention to inconsistency in the attitudes adopted by the Irish Local Government Board and by the War Office in regard to the employment of medical men of military age. The Local Government Board, as is well known, is steadily refusing to sanction the employment, permanent or temporary, in the Poor-law service of any medical man of military age. In some cases, at any rate, this refusal has resulted in dispensary districts being left derelict, owing to the difficulty of obtaining medical men past military age, and the poor have suffered. While the Local Government Board is thus straining its powers to induce medical men to join the Army, the War Office is still employing active young medical men in part-time service in areas where there is no lack of older medical men. Such anomalies are bound to cause comment. It is objected, also, that while the Local Government Board refuses to sanction the employment of young medical men, it has taken no such stand with regard to young men in other walks of life. Boards of guardians are still free to elect young men as clerks and as relieving officers, but not as dispensary doctors.

THE SERVICES.

INDIAN MEDICAL SERVICE.

IT was recently announced in the press that after the open competitive examination held last July for admission to the Indian Medical Service no similar examination would be held during the continuance of the war, but that such appointments as might be required to meet the absolutely indispensable needs of the Service would be made by nomination by the Secretary of State. To assist him in making these appointments which, as already announced, will be limited in number to the absolutely indispensable needs of the Service, Mr. Chamberlain has appointed a Selection Committee who will summon and interview such applicants as may appear to be *primâ facie* suitable, and make recommendations for appointment. Applications for appointment should be addressed to the Secretary of the Military Department, India Office, Whitehall, S.W. 1, and should contain concise particulars of the applicant's medical degrees and career. Applicants must be over 21 and under 32 years of age at the time of application. Particulars regarding pay, promotion, &c., in the Service can be obtained from the Secretary, Military Department.

ROYAL NAVAL MEDICAL SERVICE.

The following appointments have been notified:—Staff Surgeon R. R. Fassom to *Inflexible*. Temporary Surgeons: L. H. Woods, C. G. Terrell, W. A. Mein, B. H. Pain, R. Coyte, and J. B. Brash to *Victory*; C. F. Cobb, T. M. Cunnington, H. C. Waldo, and N. Braithwaite to *Pembroke*; A. G. Holman, R. H. Tasker, and J. D. Rutherford to *Vivid*.

To be Temporary Surgeons: E. E. Llewellyn, E. F. S. Gordon, D. W. R. Richardson, F. E. G. Watson, L. L. Fotheringham, A. MacA. Scott, P. G. S. Davis, C. M. Ryley, A. P. Spark, J. T. Wylie, A. D. Marston, R. Wilkins, N. F. Smith, R. D. Scott, J. Fairbrother, R. Coyte, L. H. Woods, J. B. Brash, H. R. Prentice, J. D. Rutherford.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. F. F. Carroll, D.S.O., from the seconded list, is placed on half pay.

Lieutenant-Colonels to be Acting Colonels whilst employed as Assistant Directors of Medical Services of a Division: G. St. C. Thom, C.M.G., J. W. H. Houghton.

Captains to be Acting Lieutenant-Colonels whilst commanding a Field Ambulance: W. J. Dunn, (Acting Major) W. J. Tobin.

Temp. Col. C. J. Symonds (Major, R.A.M.C., T.F.) reverts to rank of temporary Lieutenant-Colonel on reposting.

To be temporary Lieutenant-Colonels: Lieut.-Col. N. W. Nasmyth, Canadian A.M.C., Major W. Butler, R.A.M.C., T.F. (whilst in charge of the Belmont Hospital).

Majors, Canadian A.M.C., to be temporary Lieutenant-Colonels: E. R. Brown, R. Raikes, H. C. S. Elliott, A. J. MacKenzie, D. A. Clark, C. L. Doherty, R. A. Bowie, F. Guest, E. S. Ryerson, D. P. Kapelle (while O.C. Canadian Cavalry Field Ambulance), J. A. Amyot (while Consultant in Sanitation), T. A. Starkey (while Sanitation Officer), R. Wilson (while Consultant in X Ray and Medical Electricity), L. E. W. Irving, D.S.O. (while O.C. Canadian Convalescent Hospital).

Temporary Majors, Canadian A.M.C., to be acting Lieutenant-Colonels: A. T. Bazin, J. J. Fraser, A. L. C. Gilday, P. G. Bell.

Lieutenant-Colonels, Canadian A.M.C., to be temporary Colonels: K. Cameron, D. W. McPherson, F. G. Finley, W. L. Watt, R. D. Rudolf, C. F. Wylde, R. M. Simpson, F. Etherington (while O.C. Canadian General Hospital, France), J. D. Courtenay (while O.C. Special Eye and Ear Hospital), E. C. Hart (while O.C. Canadian General Hospital).

Lieut.-Col. A. E. Snell, D.S.O., Canadian A.M.C., to be temporary Colonel whilst holding the appointment of Assistant Director of Medical Services.

Temp. Major D. Donald to be temporary Lieutenant-Colonel.

Temp. Capt. G. Gow, Canadian Army Dental Corps, to be temporary Lieutenant-Colonel.

To be temporary Majors: L. Bidwell, A. S. G. Bell, Fleet-Surgeon, R.N. (ret.), A. G. Andrews, Fleet-Surgeon, R.N. (ret.), C. H. Miller, Lieut.-Col. H. H. Balfour, South African M.C. (whilst serving with S. African General Hospital, Richmond).

Temporary Captains to be temporary Majors: J. H. Spencer, N. H. Oliver, J. Bowes.

Temporary Captains, Canadian A.M.C., to be temporary Majors: G. S. Strathey, J. T. Hill, W. H. Tytler, W. Bethune, J. D. Morgan, R. H. Sutherland, G. H. R. Gibson, H. E. MacDermot, S. Ellis, G. W. O. Dowsley, J. C. Calhoun, F. A. C. Scrimger, V.C., R. H.

McGibbon, C. R. Graham, A. K. Haywood, W. A. G. Bauld, J. G. W. Johnson, F. H. Mackay, C. H. Robson, D. E. Robertson, A. W. M. Ellis, E. A. Neff, N. V. Leslie, S. MacV. Fisher, W. M. Hart, W. G. Turner, and the following while doing duty at military hospitals—J. J. Ower, H. E. Paul, A. Croll, R. H. Smith, H. C. Burgess, F. B. Bowman, M. H. Allen, M. M. Crawford, A. MacKay, W. L. Hutton, J. H. Wood, R. H. McDonald, A. H. E. Bennett, O. E. Carr, G. G. Greer. Temp. Capt. H. Buck to be acting Major.

To be temporary Captains: H. L. Tidy, B. M. Collard (late temp. Capt.), J. T. Smeall (late temp. Capt.), R. S. Dobbin, H. H. Prentiss, R. I. Wolfe (Capt. South African M.C., Res. of Off.), R. G. Moffat (Canadian A.M.C.).

Temporary Lieutenants, Canadian Army Dental Corps, to be temporary Captains: J. E. Holmes, G. S. Cameron, O. A. Elliott, C. E. Brown, J. F. Blair, F. W. B. Kelly, E. Kelly, G. V. Morton, C. E. McLaughlan, H. P. Thompson, J. W. Hagey, E. W. Hensinger, H. Ross, H. F. Alford, G. S. Atkinson, H. Clarke, R. Jamieson, A. R. Currie, J. L. Kapelle, O. N. Leslie, W. G. MacNiven, H. P. Travers, D. D. Wilson, E. C. Hutchison, J. F. Morrison, D. P. Stratton, C. H. Moore, J. W. MacDonald, R. H. Atkey, A. G. Lough, E. S. Tait, W. A. Sangster, E. D. Madden, J. F. Shute, G. H. Bray, E. J. Kelly, V. C. W. Marshall, E. C. H. Staples, W. A. Burns, J. F. Morrison, E. McNeill, K. F. Woodbury, R. E. Stone, D. J. Bagshaw, J. T. Adams, C. E. Campbell, A. V. Casman, E. H. Crawford, J. H. Duff, R. W. Fell, J. S. Girvin, O. Nase, J. W. Reynolds, H. A. Simmons, V. D. Westcott, G. E. H. De Witt, D. H. Hammell, J. G. Roberts, W. F. Baird, R. H. Campbell, H. R. Cleveland, W. P. Desmond, W. R. Fraser, H. G. Goodhand, J. A. Leblanc, R. H. Lipsey, L. D. McLaurin, J. F. O'Brien, B. Rommell, F. E. Smith, J. A. Stewart, F. W. Williamson.

B. H. Alton to be temporary Honorary Captain whilst serving with No. 22 General Hospital.

W. R. Carter to be temporary Honorary Captain whilst employed with the British Red Cross Society in France.

To be temporary Lieutenants: G. Arnott, R. T. Worthington, J. J. Armistead, R. A. MacNeill, R. B. Whitting, E. P. Carmody, T. F. A. Stowell, L. Gray, T. Mohan, C. C. Chance, G. F. Hunter, J. P. Moran, J. W. Fox, W. J. Midelton, H. G. Bywater, H. B. Corry, W. P. S. Johnson, E. McK. Reid, R. Beesley, G. P. Norman, R. H. Adams, G. B. Scott, A. R. Berrie, J. L. Rankine, V. C. H. Dearden, J. E. E. Collins, F. W. Browne, E. W. Sheaf, T. Hamilton, D. Ross, A. G. W. Owen, H. J. Brewer, F. R. Sinton, C. E. Jones-Phillipson, H. V. Deakin, F. J. Thornton, A. G. Dunn, A. G. Gamble, H. W. Jeans, A. P. Morcom, H. G. Sparrow, J. F. MacKay, E. Gardner, E. L. Councell, R. W. Johnstone, M. L. Farmer, A. MacKintosh, W. H. Howat, J. R. Stott, G. E. Downs, J. F. Sheppard, R. S. Stevenson, A. H. Sinclair, F. I. Trimmer, V. Colmer, H. S. Johnston, G. L. N. Miles, P. E. H. Patey, H. S. Vivian, G. F. Woodroffe, C. S. Stolterfoth, C. E. Evans, F. W. Stewart, W. M. Brown, M. B. Reichwald, S. J. Kerfoot, M. J. Fogarty, T. J. Killard-Leavey, H. M. MacL. Mackenzie, A. G. Gilchrist, F. Penny, C. F. Beevor, W. N. Eustace, G. H. G. Davie, A. H. Richardson, J. A. Lees, R. H. Crompton, C. H. Haddow, G. N. Montgomery, B. Sakaschansky, E. H. Good, W. B. Douglas-Drummond, F. W. Harrowell, W. H. Newton, J. B. MacKenzie, E. H. Noney, I. J. Roche, F. W. Hayes, G. Barnes, H. E. Barrett, R. H. Dix, H. L. Wilson, J. K. Thompson, R. W. Rix, T. Forde, H. A. Easton, J. B. Jordan, W. O. McKane, S. H. Kingston, G. R. Cox, G. E. Lloyd, W. Robertson, J. M. Payne, J. K. Milligan, J. B. Hughes, A. J. O'Leary, J. J. Reynolds, T. H. Lister, H. L. Pearson, H. S. Mason, R. T. Martin, A. N. E. Rodgers, W. E. Jones, G. Wacher, C. W. Cunnington, F. Baillie, B. K. Nutman, A. A. Bisset, R. Cope, N. B. Walker, C. J. Nellan, G. V. Fiddian, J. McKelvey, L. R. King, D. H. Croom, C. F. Curtis, S. Wigglesworth, C. G. Pugh, M. T. W. Steedman.

Officers relinquishing their commissions: Temp. Maj. S. A. Smith, Canadian A.M.C. (on appointment to R.A.M.C.), Temp. Capt. H. D. Welply (on account of ill-health).

SPECIAL RESERVE OF OFFICERS.

Captains to be acting Lieutenant-Colonels whilst commanding a Field Ambulance: (Acting Major) E. T. Burke, W. Tyrrell.

T. D. Watt, J. S. B. Forbes, G. R. McRobert, from Aberdeen University Contingent, O.T.C., A. Black, J. W. T. Thomas to be Lieutenants.

Officers relinquishing their commissions: Capt. J. H. Bell (on account of ill-health) and Lieuts. (on probation) T. C. Owen and C. D. Crawford.

TERRITORIAL FORCE.

Major E. N. Cunliffe to be acting Lieutenant-Colonel whilst acting as Administrator.

Capt. W. P. Ferguson to be acting Lieutenant Colonel whilst commanding a Field Ambulance.

Capt. (temp. Lieut.-Col.) H. K. Dawson reverts to the temporary rank of Major on ceasing to command a Field Ambulance.

Capt. (temp. Major) J. W. Leitch to be acting Lieutenant Colonel whilst commanding a Field Ambulance.

A. R. Muirhead and A. G. Yates to be Lieutenants.

Capt. T. J. Murray is restored to the establishment.

Lieut. S. Henry resigns his commission.

VOLUNTEER FORCE.

R. R. Jones to be temporary Lieutenant and Medical Officer, 1st Battalion, Carnarvonshire Volunteer Regiment.

NORFOLK AND NORWICH HOSPITAL.—The 145th annual report of this institution dealing with the year 1916 states that the total income, exclusive of legacies and special donations for investment, was £30,766, and the total expenditure £31,898, the deficit being largely due to the enhanced cost of supplies. An analysis of the patients treated during the year shows that (on the civilian side) 1162 were "cured," 431 "relieved," 185 "not likely to receive further benefit," while 136 died and 125 were still in hospital on the last day of the year. On the military side, 1710 were discharged to sick furlough or convalescent homes, 18 died, and 97 remained in hospital at the end of 1916.

Medical News.

ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At examinations held recently the following candidates were successful:—

Third Examination.—Richard Arthur Cooper, Apcar Galustian, William Francis Gawne, John Vaughan Griffith, George Henry Charlesworth Harding, Henry Jennings, Agnes Emilie Keen, Clifford Pullan, Len. Philip Samarasinha, and Maurice Julius Woodberg.

Final Examination.—Mary Gray Jones, Robert Austin, Samuel Saxon Barton, Rayner Laming Bellamy, Archibald Buchanan MacDougall, Alexander Balfour Black, William Brown, Norman Stewart Bruce, Lloyd William Hughes, Edward Glyn Jones, Robert Gloag Battersby, John Joseph Mulvey, Don Adrian Jayasinghe, and Russell Nelham Burton.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee, held on April 17th, 20 cases were considered, and £163 granted to 16 of the applicants. The following is a summary of some of the cases relieved:—

L.R.C.P. & S. Edin., aged 81, married, who practised in Cheshire and Yorkshire. Applicant became totally deaf a few years ago and consequently lost his practice. His wife is an invalid aged 80 years. Has three daughters, two married, and the youngest, aged 46, looks after her parents. Total income from all sources £89, and pays £28 in rent. High cost of living and illness have made it necessary to apply for help. Voted £26 in 12 instalments.—Daughter, aged 79, of M.D. Glasg. who practised at Reading and Derby and died in 1867. For many years, and until recently, lived with an old friend, a dressmaker, and they shared their slender resources. The friend now dead. Only income 7s. 6d. per week from a distant relative but this may cease any time. She has applied for the Old Age Pension. Health very bad. Voted £5 and the case to be reconsidered shortly.—Widow, aged 48, of M.B. Aberd. who practised at Ahwaz, Persia, and died there in July, 1916. Applicant left without means, with three children, ages 10 to 13. Friends have helped to furnish a house so that she may take in lodgers, but so far has not been very successful. Her husband left Persian carpets and curios in Persia valued at £380, but these cannot be moved at present. There are, however, debts to the extent of £260. Voted £10.—Widow, aged 65, of M.R.C.S. Eng. who practised at Streatham and died in 1914. Applicant was left with slender means and has a delicate daughter. Has £30 from another charity and about £20 from investments. She has recently had a stroke. Relieved three times, £36. Voted £15 in 12 instalments.—Daughter, aged 55, of M.R.C.S. Eng. who practised at Newport, Mon., and died in 1892. Applicant left unprovided for, and is very delicate. She is blind in the left eye and the other is very weak. Has recently had an internal operation. Only income a pension of £21 from another charity and help from the Guild. Relieved six times, £72. Voted £15 in 12 instalments.—Daughter, aged 69, of M.D. Edin. who practised at Hornsey and died in 1888. Applicant is the matron of an orphanage, but owing to the decrease in the subscriptions receives no salary, only home and food. Relieved three times, £17. Voted £12 in 12 instalments.—Daughter, aged 64, of M.R.C.S. Eng. who practised at Regent's Park, N.W., and died in 1853. Owing to ill-health was obliged to live on her capital, now exhausted. Has an annuity of £25 from another charity and endeavours to make a little by keeping poultry, and a friend lends her a small house. Relieved four times, £36. Voted £6 in 12 instalments.—Widow, aged 47, of M.B. Edin. who practised at Ballindalloch and died in 1910. Applicant was left unprovided for with four young children. The eldest, aged 18, has now joined the Army, and the others are still at school. Tries to make a living by taking lodgers, but cannot make enough to live on. Relieved five times, £50. Voted £10 in two instalments.—Widow, aged 61, of M.R.C.S. Eng. who practised at Maida Vale and died in 1904. Left totally unprovided for, and only able to earn a few shillings a week as a cook when her health will permit. Suffers from rheumatism. Relieved 13 times, £124. Voted £15 in 12 instalments.—Widow, aged 53, of M.B. Aberd. who practised in Warwickshire and Australia and died in 1907. Left entirely without means with three children. Son now in the Army and unable to help her, and two daughters earning their own livings and away from home. Only income about £60 a year from a relative, but this is required to pay for board and lodging. Relieved nine times, £97. Voted £12 in 12 instalments.—Widow, aged 47, of M.D. Aberd. who practised at Sheffield and died in 1906. Left without means with a young son, who is now living with a relative. Applicant's health for some time has been very indifferent, but has improved recently, and she has obtained employment at a munition works. Relieved three times, £30. Voted £10 in two instalments.

Subscriptions may be sent to the acting honorary treasurer, Dr. Samuel West, at 11, Chandos-street, Cavendish-square, W. 1.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—A reception by the President and Council of the Society will be held at the West London Hospital on Wednesday, May 23rd, at 8.30 P.M., when the West London Medal will be presented to Fleet-Surgeon Francis Bolster, B.A., M.D., and Major H. E. Priestly, R.A.M.C., for exceptional heroism in the discharge of medical duties.

LONDON MISSION HOSPITAL, SIAOCHANG, CHINA.—The report of this hospital for the year 1916 shows that in spite of difficulties created by the high price of food and drugs and the inconveniences caused by the repair and improvement of old buildings, much good work has been accomplished. Under the supervision of Dr. Ernest J. Peill and the house surgeon, Dr. Wu San Yuan, indoor treatment was given to 287 male patients and 94 female patients. The new out-patients numbered 4203 and the old patients 1599. 534 operations had been performed.

EDINBURGH UNIVERSITY.—The General Council of the University approved on May 2nd a draft ordinance for the foundation of a chair of Medical Chemistry.

WINSLEY SANATORIUM, NEAR BATH.—At the recent annual meeting of the friends of this institution the medical report stated that during 1916 the patients numbered 455, compared with 392 in 1915. The average stay of each was 80 days. The facilities offered at the sanatorium had been largely utilised for the treatment of tuberculous patients discharged from naval and military hospitals.

THE LATE MR. WALTER GIBSON.—Walter Gibson, M.R.C.S., L.R.C.P., who died on March 14th after an operation at the Lady Dudley Nursing Home in Johannesburg, was 50 years of age and had latterly been a gold-mining medical officer at Pilgrim's Rest, Transvaal. Son of the late John Gibson, of Basinthorpe, Lincolnshire, on leaving Guy's Hospital he went to Australia, settling in practice at Coolgardie. During the South African war he joined a West Australian contingent, remaining subsequently at Johannesburg, where he became well known.

Professor Arthur R. Cushny will deliver the second Sydney Ringer Memorial Lecture on Friday, May 25th, at University College Hospital Medical School, at 4 P.M., the subject being "Digitalis and Auricular Fibrillation."

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Budget.

Mr. Bonar Law's proposals in his Budget statement of Wednesday, May 2nd, do not include any new taxation; increased taxes on excess profits, tobacco, and entertainments are expected to provide sufficient new revenue for the current year.

Criminal Law Amendment Bill.

In the discussion on report of the Criminal Law Amendment Bill in the House of Commons on Monday, April 30th, proposals were brought forward to enable more stringent action in respect of prisoners infected with venereal disease and of the wilful transmission of disease.

Mr. HAYES FISHER remarked that the debate had shown that on the whole the House was more in favour of a policy of persuasion than a policy of penalty. He thought that Clause 5 in the Bill would cover a case where a man who knew that he was infected with syphilis, being a milkman went on milking cows, so that an innocent person got the disease. He was satisfied that the Local Government Board had power to make regulations under the Public Health Act, 1875, relating to venereal disease, and if they had that power they were able to go a long way to meet the case where men and women disregarded information and proceeded to infect innocent people.

Venereal Disease Bill.

The Venereal Disease Bill came before a Standing Committee of the House of Commons on Tuesday, May 1st, but slow progress was made with its consideration.

Clause 1 provided that in any area in which the Act was in operation there should be prevention of the treatment of venereal disease or the supply of remedies therefor otherwise than by duly qualified persons.

Mr. KING moved an amendment to take out the qualification implied in the phrase "in any area in which this Act is in operation." That would, he said, make the application of the Bill general.

Mr. GLYN-JONES supported the idea that the Bill should be of general application. If this were not so, pharmacists in one town would be under a disability which might not apply to those in a neighbouring town.

Mr. H. SAMUEL observed that the Government would be well advised not to suppress any means of treatment until alternatives were provided. It should be made clear that the Local Government Board would not apply the Bill to any area until the provisions for treatment were adequate.

Mr. HAYES FISHER intimated that the areas of application would be few and large, counties even being joined. The Local Government Board was arranging for covering the country with clinics.

The amendment was rejected by 21 votes to 8.

Mr. HAYES FISHER stated that he would propose an amendment to Clause 2 (Operation of the Act) that it would only be brought into operation "in any area in respect to which a scheme for the treatment of venereal disease had been approved by the Local Government Board."

Mr. DILLON moved an amendment to the effect that the medical man treating the disease should be one holding a certificate of competency to treat venereal disease.

Mr. HAYES FISHER declined to accept the amendment. A medical man might have been treating the disease for years and not possess such a certificate. Where was a medical man to obtain such a certificate? This was an impossible proposal.

The amendment was negatived without a division.

The committee adjourned.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 25TH.

Medical Reclassification in the Army.

Answering Mr. HOGGE, Mr. MACPHERSON (Under Secretary for War) stated that B 3 and C 3 men would not be passed as fit for general or other category of service unless their health improved sufficiently to warrant reclassification.

Mr. PRINGLE: Is there any security that an adequate and sufficient examination will be given before these men are passed for general service?—Mr. MACPHERSON: I have stated over and over again in this House that we were proposing to have the most competent medical boards available.

Men Discharged for Tuberculosis.

In reply to Mr. BILLING, Mr. MACPHERSON said: Officers who have ceased to hold commissions and men who have been discharged from the Army suffering from tuberculosis are not expressly excepted from the provisions of the Military Service (Review of Exceptions) Act, 1917. But my honourable friend will realise that the Army does not wish to introduce to its ranks persons suffering from tuberculosis.

Mr. HOGGE: Can my honourable friend give the House an assurance that before a man suffering from tuberculosis is taken the usual application shall be made to the Local Government Board for his medical record as a tuberculosis patient?—Mr. MACPHERSON: I shall see what can be done.

Medical Examinations in Prisons.

Commander WEDGWOOD asked the Under Secretary for the Home Department (1) whether women convicted of soliciting could now be medically examined for venereal disease if sent to prison, and, if so, under what Act of Parliament; and (2) whether his attention had been called to the arrest of two women who were sent to Holloway, medically examined for syphilis, and then acquitted; whether the prison authorities had power to have women committed or remanded medically examined without a magistrate's order; and, if not, under what power the police, magistrates, or prison officials acted.—Mr. BRACE replied: All prisoners are medically examined on reception under the Statutory Prison Rules. No prisoner is locally examined for venereal disease without his or her consent, and a magistrate has no power to order such an examination. In the case referred to, the magistrates requested the medical officer to report whether the prisoners were suffering from venereal disease, and the medical officer was able to report that in neither case was there any indication of such disease. Neither of the prisoners raised any objection to being examined. I propose to ask the Brentford magistrates what justification they had for asking for an examination in this case. There has been no time to communicate with them since the question appeared on the paper.

Ministry of Health.

Mr. GOLDSTONE asked the Parliamentary Secretary to the Local Government Board whether it was proposed to establish a Ministry of Health, and, if so, whether he would be in a position to make a full statement at an early date as to the character and extent of the work which would be undertaken by the Ministry.—Mr. HAYES FISHER replied: Proposals of this character are under consideration. I cannot, however, promise any definite date for a statement on the subject.

Training Disabled Soldiers.

Mr. G. TERRELL asked the Pensions Minister what steps, if any, had been taken to stimulate action between local war pensions committees for the purpose of training disabled soldiers and sailors.—Mr. BARNES wrote in reply: The Parliamentary Secretary and I have held meetings of representatives of local war pensions committees and heads of training institutions in various parts of the United Kingdom, and have received most satisfactory promises of coöperation in schemes for making available the best training facilities in large areas to all the local committees working in those areas. We are now in consultation with the Statutory Committee, adopting their inspection organisation to ensure early practical effect being given to those schemes.

THURSDAY, APRIL 26TH.

Payments to Panel Practitioners.

Sir P. MAGNUS asked the representative of the National Insurance Commissioners whether the amounts due to doctors for the year 1916 had been computed; when the balance outstanding would be paid; and whether, in view of the increase in the cost of living, a small sum could be released forthwith.—Sir E. CORNWALL replied: The accounting operations are being expedited as much as possible with a view to enabling Insurance Committees to effect

an emergency settlement with doctors for 1916, and it is hoped that the necessary information will be in the hands of the committees within a few weeks. I understand that Insurance Committees have already advanced to the doctors as large a sum as can safely be paid in anticipation of the settlement, and I doubt whether any additional advances, entailing, as they would, a serious risk of overpayment and subsequent recovery from the doctor, would in these circumstances be welcomed by the profession.

FRIDAY, APRIL 27TH.

Inoculation Department of St. Mary's Hospital.

Mr. WING asked the Financial Secretary to the War Office what amount of public money had been expended by his department upon the supply of vaccines from the inoculation department at St. Mary's Hospital.—Mr. FORSTER replied: Grants-in-aid to cover the cost of materials used and the extra laboratory expenses involved in the preparation of vaccines for use in military hospitals amounting to £4465 have been made to the inoculation department of St. Mary's Hospital.

MONDAY, APRIL 30TH.

Treatment of Blinded Soldiers in Scotland.

Answering Mr. DUNCAN MILLAR, Mr. BARNES (Pensions Minister) said: Arrangements have been completed by which the facilities afforded at Newington House, Edinburgh, are to be utilised to the full extent necessary for the treatment of blinded sailors and soldiers domiciled in Scotland. The committee of Newington House have also made themselves responsible for the settlement of men trained there and have charged themselves with the after-care of these men. I would add with reference to an answer which I gave to a question in the House on March 8th last that a conference between the authorities of Newington House in Edinburgh and St. Dunstan's in London, held at my suggestion, has resulted in the complete and cordial agreement for coördinating the work of these two establishments.

TUESDAY, MAY 1ST.

Calling up the Medical Profession.

Mr. MACVEAGH asked the Under Secretary for War, with reference to the conscription of doctors, whether he could state on what date the War Office discovered that they stood in need of further medical assistance.—Mr. MACPHERSON answered: The need of assistance from the medical profession has, of course, been continuous. If my honourable friend refers to the recent call, I think he is aware that it is consequent on the decision to establish more hospitals overseas.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

SHEARER, A., M.B., Ch.B. Edin., has been appointed Medical Officer to the Newtown Urban District Council for the period of the war.

ST. THOMAS'S HOSPITAL.—Casualty Officers and Resident Anæsthetists: WOOLRICH, W. G., PEARCE, A. H., HARTLEY, L. B., and DAVIES, P. G. S. Resident House Physicians: BESWICK, W. T., MAVROGARDATO, A., ANWYL-DAVIES, T., and HIGGINS, L. G. Resident House Surgeons: GILKS, J. L., JENNINGS, H. C., LEATHAM, H. W., and ROWLAND, J. House Surgeon to Block 8: MARRIOTT, W. Obstetric House Physician: PINK, C. V.

Certifying Surgeons under the Factory and Workshop Acts: BALL, E. J., Paignton, Devon; MCCLURE, T., L.R.C.P. & S. Edin., L.F.P.S. Glasg., Glyn-neath, Glamorgan; and OLLERHEAD, T. H., L.R.C.P. Lond., M.R.C.S., Minehead, Somerset.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

APPLECROSS, ROSS-SHIRE.—Medical Officer and Public Vaccinator. Salary £320 per annum.

BERMONDSEY MEDICAL MISSION FOR WOMEN AND CHILDREN.—Qualified Medical Woman as Locum. Salary £150, with board and residence.

BODMIN, CORNWALL COUNTY ASYLUM.—Female Junior Assistant Medical Officer. Salary £200 per annum, with board, &c.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.—House Surgeon. Salary £150 per annum, with board, &c.

BOLTON INFIRMARY AND DISPENSARY.—Second House Surgeon. Salary £200 per annum, with board, &c.

BRIGHTON, ROYAL SUSSEX COUNTY HOSPITAL.—Senior House Surgeon. Salary £140 per annum, with war bonus.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURSLEM, HAYWOOD HOSPITAL.—Female Resident Medical Officer. Salary £200 per annum, with board, &c.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

CUMBERLAND, COUNTY OF.—Female Assistant Medical Officer. Salary £350 per annum.

DERBY, DERBYSHIRE ROYAL INFIRMARY.—Two House Surgeons. Salary £200 per annum, with board, &c.

EVELINA HOSPITAL FOR CHILDREN, Southwark, S.E.—House Physician. Salary at rate of £160 per annum, with board, &c.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

HULL, VICTORIA HOSPITAL FOR SICK CHILDREN.—House Surgeon.

IPSWICH, AUXILIARY HOSPITAL FOR WOUNDED, Lattice Barn.—House Physician. Salary as arranged, with board, &c.

IPSWICH, EAST SUFFOLK AND IPSWICH HOSPITAL.—Two Female Resident Officers.

JOHANNESBURG, SOUTH AFRICAN SCHOOL OF MINES AND TECHNOLOGY.—Professor of Anatomy and Professor of Physiology. Salary £1000 per annum each.

LEICESTER ROYAL INFIRMARY.—Two Resident Surgical Officers. Salary £250 per annum, with apartments, &c.

LIVERPOOL COUNTY ASYLUM, Rainhill.—Temporary Assistant Medical Officer. Salary 7 guineas a week, with board, &c.

MANCHESTER, CITY OF.—Temporary Assistant Tuberculosis Officer. Salary £400 per annum.

NEWCASTLE UPON-TYNE, ROYAL VICTORIA INFIRMARY.—Resident Medical Officer. Salary at rate of £300 per annum, with board, &c.

NOTTINGHAM CHILDREN'S HOSPITAL.—Female House Surgeon. Salary at rate of £200 per annum, with board, &c.

NOTTINGHAM CITY ASYLUM.—Locum Tenens. Salary £7 7s. per week, with board, &c.

NOTTINGHAM GENERAL HOSPITAL.—Two Assistant House Surgeons for six months. Salary at rate of £250 per annum each, board, &c.

NOTTS COUNTY COUNCIL.—Second Assistant Tuberculosis Officer. Salary £400 per annum.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.—Casualty Officer.

RHONDDA URBAN DISTRICT COUNCIL.—Temporary Assistant Medical Officer of Health and School Medical Officer. Salary £350 per annum.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Senior Resident Medical Officer. Salary £200 per annum. Also House Physician (salary £50 per annum, with board, &c.), to include duties at Endsleigh Maternity Hospital. Salary given.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—Temporary House Physician. Salary at rate of £200 per annum, with board, &c.

WARWICKSHIRE AND COVENTRY JOINT COMMITTEE FOR TUBERCULOSIS.—Temporary Tuberculosis Officer. Salary £500 per annum.

WELLS ASYLUM, SOMERSET.—Temporary Assistant Medical Officer. Salary £300 per annum, with board, &c.

WESTERN GENERAL DISPENSARY, Marylebone-road, N.W.—Honorary Ophthalmic Surgeon.

WORCESTERSHIRE, KING EDWARD VII. MEMORIAL SANATORIUM, Knightwick.—Medical Superintendent. Salary £450 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Grosmont, Yorks.

Births, Marriages, and Deaths.

BIRTHS.

BARNETT.—On April 25th, at Gernrode, Berkhamsted, Herts, the wife of Dr. Burgess Barnett, of a daughter.

HEDLEY.—On April 30th, 1917, at 65, Harley-street, W., the wife of John Prescott Hedley, F.R.C.S., Captain, R.A.M.C. (T.), of a son.

RYLAND.—On April 28th, at West Cottage, Wrecclesham, Farnham, the wife of Captain Ryland, R.A.M.C., of a son.

MARRIAGES.

DORE—GREATWICH.—On April 26th, at Holy Trinity Church, Sloane-street, Captain N. A. Dore, R.A.M.C., to Dulcie, eldest daughter of Mr. and Mrs. Greatwich, Lickhill Manor, Stourport.

GRAY—COOPER.—On April 26th, at St. John's, Red Lion-square, Archibald Montague Henry Gray, M.D., Major, R.A.M.C., T.F., to Elsie, youngest daughter of the late F. B. Cooper, of Newcastle, Staffs.

READE—NEWMARCH.—On April 28th, at Christ Church, Streatham hill, by the Rev. H. D. L. Viener, M.A., R.N., Senior Chaplain, Royal Naval Barracks, Chatham, Surgeon Arthur G. L. Reade, R.N.V.R., younger son of the late Arthur Edward Reade, Esq., and Mrs. Reade, of Streatham, to Violet Newmarch, M.R.C.S., L.R.C.P., only daughter of Henry Newmarch, Esq., and Mrs. Newmarch, of Vancouver, B.C.

REES—MACLEOD.—On April 28th, at St. Columba's, Pont-street, London, Captain W. A. Rees, R.A.M.C., to Christine, daughter of Mr. and Mrs. Macleod, Portvoller, Stornoway.

WALL—TRIPP.—On April 28th, at St. Luke's, Chelsea, Reginald Cecil Bligh Wall, M.A., D.M., F.R.C.P., to Dorothy, younger daughter of Mr. and Mrs. Herbert Innes Tripp.

WALLACE—NORRINGTON.—On April 28th, at Plymouth, Captain Quentin Vaughan Brooke Wallace, M.C., R.A.M.C., to Freda, youngest daughter of Mr. and Mrs. A. R. Norrington, of Plymouth.

DEATHS.

BROGDEN.—On April 15th, missing, believed drowned, Lieutenant Ingram R.R., R.A.M.C.

STEAR.—On April 25th, at Saffron Walden, Henry Stear, M.R.C.S., aged 87.

WOOD.—On April 23rd, killed in action, Lieutenant Paul Bernard Wood, M.A., LL.B., L.D.S., Royal Fusiliers, aged 31.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

RHUBARB.

RHUBARB is now becoming plentiful and is very largely used as an addition to the diet. The root also is greatly in demand for medicinal purposes, the best varieties being collected in China and Thibet. The following account of the history of rhubarb in this country is of some interest.

The edible rhubarb was introduced into England in 1573, but only the leaves apparently were eaten. Mr. William Hayward, apothecary, of Banbury, seems to have been the original cultivator of rhubarb in that locality. In a letter, dated Oct. 29th, 1789, addressed to Mr. More, secretary to the Society of Arts, Mr. Hayward states that he had been a cultivator of "the true Turkey rhubarb" for about 12 years; and "had so far succeeded, as to have disposed of and used, within the last three years, more than two hundredweight of that article"; and he therefore offered himself as a candidate for the Society's premium for promoting the culture of this useful drug. The Society, however, only "voted their silver medal to him as a bounty." In 1794 he claimed the Society's gold medal for raising the greatest number of rhubarb plants, and this was adjudged to him by the Society. The seed came from Russia. Overall, the chronologer, said that "the Society of Arts gave a gold medal to Mr. Ball for the cultivation of this esculent in 1790, and to Mr. Thomas Jones, of Enfield, in 1793, and again in 1797.

Lindley in his "Flora Medica" (1838) says: "It is stated by Stevenson and Churchill that *Rheum palmatum* is extensively cultivated near Banbury for the supply of the London market," but Mr. William Bigg made the statement in 1846 that in the neighbourhood of Banbury "only one species is in cultivation for medicinal sale: the *Rheum rhaponticum*. It has no distinctive popular name." He added:

> The principal, and with a small exception, the only mart for English rhubarb root is London. It is there purchased by the wholesale druggists, who would probably state that a great part of it is subsequently exported. Some of it is sold no doubt to the Jews and Turks *as English*, but I strongly suspect that a much larger portion is sold to the Christians as *foreign*. The "cuttings" make I dare say a very decent powder, mixed according to conscience with East India rhubarb.

Lindley said the English sort was sold by itinerant vendors who carried the delusion further by arraying themselves in Oriental costume. Mr. Bigg continued:—

> I have heard it stated on computation that not less than about twenty tons are, in the various forms described, annually sent into the market. I know of no other place in which rhubarb is grown for medicinal purposes in a wholesale way. A field of rhubarb when in flower—the stalks from six to ten feet in height—has a very striking appearance, and cannot be passed without observation. The leaf-stalk grown in private gardens is not unfrequently preserved with sugar, and is recommended in that form by Dr. Kerr, of Northampton, as a laxative.

A part of Mr. Bigg's statement which has particular interest at the present time is as follows:—

> Of the leaves, I believe no use is now made, except the use common to all vegetable offal—manuring. The leaf stalks are now very partially sold for the table. In former years, the sale of the leaf stalks formed a part of the trade, but it can scarcely be said to do so now. Wine has been occasionally made of them, but not to any important extent. Curious housekeepers here and there make a little to increase the variety of the table at the village "wake."

Lindley relates that "in Queen Elizabeth's time rhubarb leaves were used as a potherb and considered superior to spinach or beet. The use of the tender leafstalks is comparatively of modern date for tarts, &c." A French chronicler years ago stated, apparently surprised, that "in England, Sweden, and Siberia they eat the leaves and young shoots." One well-known English writer on food says: "The leaves were formerly boiled and made into a sauce for meat." If the leaves are indeed "superior to spinach," they could now be boiled and eaten as greens instead of being thrown away, and we could thus form a link with the Elizabethans. No doubt a good deal depends on the species of rhubarb whether its leaves are tasty. They certainly can be eaten either plain or mixed with other greens.

In the *Gardeners' Chronicle* for 1846 Mr. A. Forsyth first directed attention to another part of rhubarb as being suited for culinary purposes and to which he gave the name of rhaflower—this is the large globular pouch of unopened flowers. It was perhaps in 1820 that the stalks were first used for tarts and jam, but Dr. John Fothergill perhaps used in that way some of the gigantic rhubarb he raised in 1778. He had a botanical garden at Upton, near Stratford, Essex.

THE COOLIDGE X RAY TUBE.

IN a catalogue which we have received from the British Thomson-Houston Company, Limited, Mazda House, Upper Thames-street, E.C., is an interesting and illustrated account of the Coolidge focus tube in its latest form. In all focus tubes that preceded the new design, the discharge between the cathode and anti-cathode, and therefore the production of X rays, was dependent upon the presence of residual gas in the tube. During use the gas is driven to the walls of the tube and the discharge stops, the operation of the tube on this account being uncertain and variable. In the Coolidge tube, however, exhaustion is carried to a much higher point, the pressure of the remaining gases not being greater than a few hundredths of a micron (0·001 mm.). Through this attenuated atmosphere no discharge will pass even when a current at 100,000 volts is applied to the terminals. In order to create a conducting path between the electrodes, the cathode is furnished with a small flat and closely-coiled spiral filament of tungsten wire placed within a conducting cylinder or ring connected to it, and so placed that the cathode rays are focussed upon the target or anti-cathode. This filament is heated continuously, while the tube is in operation, by current from a portable accumulator or from some other source of supply at a suitable voltage. In its completed form the length overall of the Coolidge tube is 20 inches and its greatest diameter 8 inches. The extremely high penetration secured is much greater than was possible with any earlier design. It can readily be adjusted to give any required penetration, this being determined by the voltage across the terminals, the volume of discharge between the electrodes being dependent upon the value of the current passed through the heated filament. In a few seconds the tube can be altered to give a hard or soft effect, and it will maintain any required degree of hardness for an indefinite period. Stability is shown by the fact that it may be used by many operators for several hours daily without any adjustment and with no perceptible variation in results, its life averaging upwards of 1000 running hours. For therapeutic, fluoroscopic, and most radiographic work a tube with medium focus is suitable, but fine or broad focus spots can be furnished, the former being suitable for the most rapid radiographic purposes.

THE SWARREN CRUTCH-SEAT.

Messrs. Graham and Latham, Limited, military engineers, of 104, Victoria-street, S.W., have sent us a simple but ingenious device for providing a ready means of rest for those who are under the necessity of using crutches. It consists of a stout canvas webbing, 3 inches wide, with steel attachments at each end for affixing to crutches with cross-bar hand-pieces. When fixed the band and the crutches together take the form of a large capital H with the cross-piece in concave shape to form the seat. The band can be carried in the pocket, it is made to fit any standard crutch, and the steel attachments firmly and automatically lock themselves to the crutches. The price, carriage paid, is 7*s.* 6*d.*, but a substantial discount is, we understand, given to Red Cross and allied societies.

OPTICAL AIDS.

To the Editor of THE LANCET.

SIR,—In the "Personal" column of the *Times* a few days ago there appeared a notice reminding officers and others invalided home who have no further use for glasses issued to them by Lady Roberts's Field Glass Fund that they should return them for re-issue to Lady Roberts, 64, Victoria-street, London, S.W.1. It was stated that "the need now for glasses is more urgent than ever." The following hints may be useful in emergencies, failing the supply of proper glasses. I have found that two ordinary eyeglasses (monocles) make, in a suitable leather pocket-case, probably the most compact small-range telescope obtainable. A moderately strong concave eye-glass placed by one hand quite close to the eye, and a quite weak convex eye-glass held by the other hand more or less at arm's length, according to focus, will give good results if the eye-glasses are suitably chosen; and a curious telescope may be made by looking through the clear solid bottom of a drinking-glass (tumbler), which generally acts as a diminishing lens, in conjunction with a slightly magnifying lens held in the other hand. A short-sighted man who has lost his spectacles has been provided by Nature with a temporary emergency aid by making the letter q with his fingers—that is, the index-finger and thumb of the left hand are pressed together like the loop of the q, and the right hand index-finger touches the two tips like the stroke of the q. By pressing the straight finger more or less on the "looped" fingers and looking through the tiny triangular aperture or space between the finger-tips, the myopic man can see the distant scene distinctly. A short-sighted man can use a single convex lens held more or less at

arm's length, as a telescope (although the image is inverted). Again, the combination of lenses forming the top "draw" of a terrestrial telescope will act as a very strong magnifying glass or a weak microscope. This idea has been utilised in some small telescopes, so that they can be more conveniently used as "microscopes." It is unnecessary to mention pin-hole lenses or double pin-hole lenses for the myopic; they are well known.

It will be admitted that if the need for proper glasses is urgent they should be provided. The modern prismatic glasses have, of course, superseded the old binoculars in many ways.

I am, Sir, yours faithfully,

April 26th, 1917. MYOPE.

Σ.—The address of the National Council for Combating Venereal Diseases is now Bank Buildings, Kingsway, London, W.C. 2. Secretary, Miss H. F. Norry. Telephone: Holborn 562.

Entente.—The attitude to be adopted is entirely in the discretion of the practitioner. Where the medical man cannot from circumstances give reciprocal service it is usual for him to offer a fee, and quite reasonable that it should be accepted. Where the medical patient is more well-to-do than the adviser we have the same position. Operations stand in a different category, and when not performed for a colleague gratuitously, as they frequently are, they are usually made the subject of agreement. The question of the family is settled by similar considerations. There is no rule, but a very wide custom. This, however, would not invalidate legal proceedings.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Wednesday, May 9th.

SURGERY: SUB-SECTION OF PROCTOLOGY (Hon. Secretaries—P. Lockhart-Mummery, W. Sampson Handley): at 5.30 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.
Cases (at 5 P.M.):
Mr. P. Lockhart-Mummery: (1) Abdomino-perineal Excision of Rectum in a Man aged 23; (2) Ileo-sigmoidestomy for Colitis Polyposa.
Discussion.
On "The Methods of Making and Closing Colostomy Openings," will be opened by Mr. Lockhart-Mummery.
Members of the SECTION OF SURGERY are specially invited to attend. Any who wish to take part in the Discussion are asked to send in their names to the Hon Secretary of the Sub-section.

Friday, May 11th.

CLINICAL (Hon. Secretaries—David Forsyth, T. P. Legg): at 8 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.
Cases:
Dr. Parkes Weber: Intermittent Claudication of the Left Lower Extremity.
Dr. Irwin Moore: (1) Lupoid Tuberculosis of the Pharynx affecting the Uvula and Soft Palate in a Boy aged 8; (2) Two Cases of Pharyngeal Pouches.
Paper:
Dr. Parkes Weber: The Pel-Ebstein Recurrent Pyrexial Type of Hodgkin's Disease (Lymphogranulomatosis Maligna).

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.
THURSDAY.—Hospital closed. Annual Meeting.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THE THROAT HOSPITAL, Golden-square, W.
MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.
TUESDAY.—3 P.M., Prof. C. S. Sherrington: Rhythmic Action in Muscle and in Nerve. (Lecture II.)

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.
Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—
WEDNESDAY.—4 P.M., Lecture IV.:—Major F. W. Mott, M.D.: The Pathology of Venereal Disease. Followed by a discussion.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C. 2.

MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d*. The rates of subscription remain as revised in October.

INLAND.

One Year	£1 10 0
Six Months	0 16 0
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COLONIES and ABROAD.

One Year	£1 12 6
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Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C. 2.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C. 2, are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)
THE LANCET Office, May 2nd, 1917.

Date.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Tem.	Wet Bulb.	Dry Bulb.	Remarks.
April 26	...	83	58	37	39	43	Cloudy
" 27	...	97	61	43	47	52	Cloudy
" 28	...	105	63	45	49	54	Fine
" 29	...	110	63	50	48	56	Cloudy
" 30	...	90	63	49	50	57	Cloudy
May 1	...	93	66	47	50	53	Fine
" 2	...	100	70	48	51	54	Fine

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

BOOKS, ETC., RECEIVED.

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Manual of Chemistry. By W. Simon, Ph D, M.D., and Daniel Bose, Ph.D. Eleventh edition, revised. 18s. net.

BELL, G., AND SONS, Ltd., London.
The Passing of the Great Race; or, The Racial Basis of European History. By Madison Grant, Chairman, New York Zoological Society; Councillor, American Geographical Society. 8s. 6d. net.

CAMBRIDGE UNIVERSITY PRESS.
Growth and Form. By D'Arcy W. Thompson. 21s. net.

CHURCHILL, J. AND A., London.
Method of Enzyme Action. By James Beatty, M.A., M.D., D.P.H. With Introduction by Professor E. H. Starling, M.D., Sc.D., F.R.S. 5s. net.

MASSON ET CIE., Paris. (Collection Horizon.)
Les Fractures de la Mâchoire Inférieure. Par L. Imbert et Pierre Réal. Avec Préface du Médecin Inspecteur Général Février. 4 fr.
Blessures du Crâne et du Cerveau. Formes Cliniques et Traitement Médico-Chirurgical. Par C. Chatelin et T. De Martel. 4 fr.
Traitement et Restauration des Lésions des Nerfs. Par Mme. Athanassio-Benisty, Interne des Hôpitaux de Paris. Avec Préface du Pr. Pierre Marie, Membre de l'Académie de Médecine. 4 fr.
Les Fractures de l'Orbite par Projectiles de Guerre. Par Félix Lagrange. 4 fr.
Les Psychonévroses de Guerre. Par le Dr. G. Roussy, Professeur Agrégé à la Faculté de Paris, et J. Lhermitte, Ancien Chef de Laboratoire à la Faculté de Paris. 4 fr.

MILFORD, HUMPHREY, OXFORD UNIVERSITY PRESS, London, Edinburgh, Glasgow, New York, Toronto, Melbourne, and Bombay.
Who Can be Happy and Free in Russia? By N. Nekrassov. Translated by Juliet M. Soskice, with introduction by Dr. David Soskice. The World's Classics. 1s. 3d. net.

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Hunterian Lecture
ON
GUNSHOT WOUNDS OF JOINTS, THEIR PATHOLOGY AND TREATMENT.

Delivered before the Royal College of Surgeons of England on March 2nd, 1917.

BY FRANK COOK, B.Sc., M.B., B.S. LOND., F.R.C.S. ENG,
CAPTAIN, R.A.M.C.(S.R.); HUNTERIAN PROFESSOR, ROYAL COLLEGE OF SURGEONS OF ENGLAND.

MR. PRESIDENT AND GENTLEMEN,—I beg that you will accept these observations as suggestions, based on the somewhat scanty pathological data at our disposal and an experience necessarily incomplete, rather than as ordered statements of surgical law resulting from a comprehensive study. My personal impressions have been gained almost entirely from field ambulance and casualty clearing station work in France and Belgium, and my remarks are therefore subject to correction by those who have a more intimate knowledge of the later course and treatment of these lesions. At the same time one wishes to emphasise the supreme importance of an adequate treatment of wounds at the earliest favourable opportunity.

Since the progress of joint wounds has been far from satisfactory and radically different lines of procedure have been advocated, it would seem profitable at this stage of our experience to consider all the pathological data at hand in the hope of rationalising treatment in general and controlling that of individual cases. Unfortunately, the scientific facts available are insufficiently complete to place any definite system beyond the range of debate. It remains to utilise them in a critical examination of the various practices in vogue, and otherwise to formulate a working basis on the ground of clinical observation, guided by an ever-present recognition of military limitations and resources.

PATHOLOGY.

A joint directly wounded is subject to infection from two sources, the projectile itself and the track of the projectile from the exterior. When present, the former varies in degree of virulence from the comparatively clean undistorted rifle bullet to the irregular shell fragment enwrapped in muddy clothing and loaded with bacteria. Infection may also spread to a joint from neighbouring wounds, either by way of the soft tissues or along a fissure in a fractured bone. Joints are generally agreed to be peculiarly susceptible to infection; in civil practice a surgeon tends to take more precautions in opening a joint than any other cavity, whilst it is significant that joints are early affected in most pyæmic conditions. Although the signs of inflammation are less obvious in wounded joints on account of the usual outlet for excess of fluid and consequent relief of tension, the frequency of disaster is at least as great. An environment conducive to the well-being of micro-organisms obtains; the synovial cavity presents a sac comparatively free from air and a plentiful supply of desirable medium; on the other hand, it is probable that the arrangement of the blood-supply, the anatomical formation of the synovial cavity with its various complexities, and the viscidity of the fluid may hinder the excursions of the polymorphs and the free circulation of lymph on which the inflammatory processes depend for success.

What powers has a joint of combating bacterial invasion? *That there is a very considerable reactive mechanism has been demonstrated* by Lazarus-Barlow, Delbet, and other observers. A foreign body in a joint, possibly lodged in bone, may be covered with micro-organisms; the surface of the osseous cavity in contact with the projectile and the edges of the wound in the synovial membrane also are infected; but it is with the greatest rarity that the synovial fluid and blood effused into the joint exhibit bacteria within the first 24 hours. According to Lazarus-Barlow, a large proportion of fluids show no organisms in films or on culture, even at a much later period. Blood withdrawn from a wounded joint at a very early stage contains excess of leucocytes. This question of leucocytosis may be examined more closely, as it has a practical bearing on prognosis and treatment. Generally speaking, an aseptic lesion is associated with a mononuclear leucocytosis and a septic lesion with a polynuclear leucocytosis; moreover, the latter varies to a certain extent with the potency of the infection. Hence a differential count of the leucocytes and red cells in the synovial cavity of a wounded joint, together with an estimate of the total number in the effusion, enables one to classify roughly the severity of the infection and forecast a prognosis accordingly (Lazarus-Barlow). The method of "pyoculture" is said by Delbet to afford a more accurate estimate in the same direction, as it indicates directly the presence and relative virulence of bacteria with greater delicacy than the usual cultural methods.

Various micro-organisms have been found in wounded joints; their exact nature does not appear to bear any definite relationship to the clinical issue, except in the case of streptococcal infection where the prognosis is bad.

When the wound is accompanied by fracture, as occurs almost invariably in joints other than the knee and occasionally the shoulder, the outlook is definitely more serious, as the phenomena of osteomyelitis in some degree may be imposed on those of joint infection pure and simple.

Anatomically, the following forms of joint wound may be recognised:—

1. Wounds in which the articular lesion merely represents an element of a wholesale destruction of the limb in the neighbourhood of the joint.

2. Articular fractures proper, including the majority of joint wounds. A projectile may be present in the synovial cavity or in the adjacent bone; or, having passed through the joint, it may be arrested in the ligaments or the soft tissues outside. The types of fracture are numerous; one or more bones may be affected. (*a*) An impression or gutter in the articular or non-articular surface of the bone is made by the projectile in passing. (*b*) The projectile is embedded in the surface of the bone; fissures may radiate from the osseous cavity. (*c*) The projectile has passed through the bone with or without fissuring. The latter possibility is only likely to be realised where the cortex of the bone is thin, as in the lower extremity of the femur. Where the compact layer is thicker, as in the upper end of the tibia, penetration is almost invariably accompanied by fissures. (*d*) The projectile is lodged in the substance of the bone forming a cul-de-sac with or without fissuring. The latter condition is again dependent on a lack of thickness in the shell of compact bone. (*e*) One or more fragments of bone of varying size, from a small splinter to a large block such as a femoral condyle, are separated with or without dislocation. (*f*) Fissures pass for a considerable distance into the shaft of the bone. (*g*) There is much comminution of one or more of the osseous extremities.

3. Penetrating wounds of the joint without fracture, in which the projectile may or may not remain in the synovial cavity.

Classes 2 and 3 include a definite and common type of wound, usually due to a rifle bullet, in which the projectile has passed through the joint, inflicting tiny wounds of entrance and exit, with or without fracture.

In many cases it is difficult to decide on anatomical grounds whether the synovial cavity has been penetrated or not—e.g., through-and-through wounds of the front of the thigh in the neighbourhood of the supra-patellar synovial pouch, or wounds in which the foreign body has been arrested in the ligaments before entering the joint. An effusion into the joint commonly occurs in these cases.

A fissure may reach the articular extremity of a bone from a fracture originating outside the joint, in which case there is an additional danger of infection when the foreign body remains lodged in the shaft at the site of fracture. On the contrary, a projectile entering the bone outside the joint may pass into the articular extremity and lodge there without causing a break of the actual articular surface.

TREATMENT.

General Considerations.

Apart from the nature of the joint wound itself, it is essential to take into account certain other factors of importance in deciding on a line of treatment.

The condition of the patient may be profoundly influenced by shock or, at a later stage, by toxæmia. Either of these may result from the wound in question or from wounds in other parts of the body. Shock may prohibit an operation otherwise indicated; toxæmia of marked degree may precipitate an amputation. Injury to neighbouring parts—e.g., the popliteal artery in the case of the knee, or the chest in the case of the shoulder—may render the articular wound of secondary importance and modify accordingly the treatment.

The age of the wound is a factor of the greatest importance. Given the necessary conditions, the earlier the primary or prophylactic form of treatment is applied the better. During the first 24 hours there is ample evidence to show that the sources of infection tend to be limited to their original foci. After this period there is less possibility of complete eradication. At the same time, it is an unjustifiable procedure to open a joint under unsatisfactory conditions as regards asepsis; a further delay, if not too prolonged, affords the lesser evil. Professor Tuffier, who has great experience in this subject, tells me that he has recently had results almost uniformly favourable from operations performed as late as the third day after receipt of the injury. To perform any considerable operation on a joint requires a surgeon of some judgment and ability, not too pressed for time, a well-equipped theatre, and a preliminary X ray examination. It is further desirable that there should not be urgent need for transport immediately after operation. These conditions are usually fulfilled at a casualty clearing station, but not during periods of high pressure. *A strictly conservative line of treatment is preferable to half-hearted operative measures.*

In planning treatment, even in the earliest stages, one should have in mind a higher ideal than that of merely saving life or limb. *Consistent with the patient's general safety, every effort must be made to anticipate unnecessary orthopædic disability.*

Observations on the treatment of joint wounds in general apply more particularly to wounds of the knee. Reference will be made later to peculiar features in the treatment of individual joints.

Preliminary Treatment.

Immobilisation is the most important measure in the early stages. The sooner the joint is immobilised the better: a splint or other improvised fixation apparatus should be applied whenever possible at the aid-post, if not before, and at the field ambulance invariably. The objects are obvious: in the first place, unnecessary shock and hæmorrhage are obviated by fixation of the limb during the first stages of transport; secondly, infection is limited. Not only does movement tend to spread infected particles throughout the cavity, but it may cause infection of a previously unaffected joint from a focus outside the synovial membrane. Beyond this immobilisation and the application of ordinary dressings, one would suggest that no further treatment should be applied to the joint as such until the patient reaches a unit equipped for any necessary operation. It is important, however, that he should reach this unit at the earliest possible moment.

Expectant Treatment.

There is a large class of cases in which the evolution of the wound is so habitually favourable as to render any form of primary arthrotomy unjustifiable; although it may be necessary to remove an extra-articular source of infection. Even the most radical school of joint surgery admits that the *in-and-out type of wound with punctiform cutaneous apertures of entrance and exit has a very good prognosis.* The projectile, an undistorted rifle bullet or a very small shell fragment, has presumably introduced into the joint an inconsiderable amount of infective material of which it has carried away the greater part on leaving. The internal source of infection is thus reduced to a minimum; there is practically no communication with the exterior. The joint can adequately deal with the situation apart from operative interference. Even if there be an osseous lesion it may be regarded as a simple articular fracture. The essential steps of treatment are a careful cleansing of the skin around the wounds and a rigid immobilisation of the joint. There may be a considerable effusion into the synovial cavity; to aspirate this at an early stage is potentially dangerous, since infective matter may be sucked into the joint by the procedure. Moreover, the accumulation tends to recur, and is possibly beneficial as a reactive product. The injection of antiseptics such as ether or formalin glycerine emulsion has been advocated, but it would seem more reasonable to avoid any form of interference with the natural mechanism on which the expectant form of treatment essentially relies.

More debatable is the treatment of those *cases in which a rifle bullet or tiny fragment of shell has lodged in the substance of an articular extremity after passing through the synovial cavity, creating an insignificant wound of entrance and no obvious fissuring of bone.* As before, there is practically no danger of infection from without, and although there is a definite source within, the nature of the projectile renders it comparatively innocuous. If the foreign body is so situated as to render its removal more than usually difficult without considerable derangement of the joint and enlargement of the osseous track, the risks of operation are greater than those of retention. But if the body be more readily accessible the balance turns in favour of a primary operation.

An essential feature of expectant treatment is a constant supervision of the clinical course of a case supplemented by pathological examinations of the fluid of the joint. In this way, adverse signs are detected at the earliest opportunity should the necessity for more active measures arise.

Extra-synovial wounds, whether of the soft parts or of bone, are treated as soon as possible by removal of foreign bodies, thorough excision, Carrel's tubes, &c.; arthritis may thus be obviated even though a fissure radiate from the focus of an osseous lesion to the joint. Frequently an articular effusion accompanies these neighbouring wounds; primary arthrotomy is not on that account indicated. Strict immobilisation is essential.

Primary Operative Treatment.

In all classes of joint wound other than the foregoing there is at least one potent source of progressive infection which demands removal at the earliest opportunity. This may be a foreign body, an infected cavity of bone, a synovial wound open to infection from without, or all three combined. *A priori*, it would seem highly desirable to perform the necessary operation at the earliest favourable opportunity. In fact, experience has shown that *this prophylactic form of treatment is most reliable when applied within the first 12 hours*, although its value is by no means limited to that period. The following measures are included under this heading:—

1. Excision of external wounds and suture of the synovial membrane.
2. Arthrotomy, followed by (*a*) removal of foreign matter, blood clot, infected edges of synovial membrane; (*b*) treatment of osseous cavities and removal of fragments of bone ("esquillectomy"); (*c*) suture.
3. Partial or complete resection of the joint.
4. Amputation.

Cases in which there is a lesion of the soft parts more extensive than the punctiform wounds of a former class, but little or no bony defect; and in which the joint contains no foreign body.—These are treated by careful excision[1] of the wound as far as the synovial membrane; the edges of the latter are excised also, and blood clot is expressed from the joint. Lavage of the cavity and the injection of antiseptics is a doubtful proceeding in these cases, where the object of treatment is to prevent further infective material from entering the joint and otherwise to rely on natural resistance. The gap in the membrane is completely sutured with catgut if possible.

The external wound is treated by simple drainage, Carrel's method, or salt packs. In excising the track it is advisable to make it more or less cone-shaped, thus facilitating outward drainage. The application of an antiseptic, such as ether or brilliant green, supplements the mechanical disinfection. Primary suture of the whole track implies unusual success in antisepsis, as it necessarily risks a secondary infection of the joint.

When the gap in the synovial membrane is too large to be completely sutured the prognosis is less favourable, as the danger of reinfection remains. It is often possible to close the joint by suturing into position a flap of ligament or fascia free from infection, and partially separated from the tissues in the neighbourhood by an incision which does not eliminate its blood-supply. Failing this, excision of the wound is followed by Carrel's treatment or merely by the application of aseptic dressings (the latter not to be removed apart from definite indications). On no account should drainage-tubes be introduced into the joint at this stage; they increase very definitely the danger of infection from without, and serve no useful purpose.

Cases in which the joint contains a foreign body with or without fracture; and cases in which comminution of bone is associated with an open wound of the joint.—In these there is a focus of infection within the joint; there may be a path

[1] The routine excision of wounds, since accepted as a general measure, was advocated and practised with excellent results by Captain E. T. C. Milligan, an Australian surgeon, as early as January, 1915.

of infection from the exterior; there may be a potentiality of mechanical derangement of the joint. According to the varying importance of these factors, there is a range of operative treatment from simple extraction of a foreign body to complete resection of the joint or even amputation. The desirability of operating on the second class of case (comminution without remaining projectile) has been debated; but as detached fragments of bone in association with an open wound essentially represent infected foreign bodies, and are more than likely to overtax the natural reactive powers of a joint already fully exercised, their early removal is definitely indicated.

A careful X ray examination is a necessary preliminary to the treatment of these cases; foreign bodies and fractures are recognised and localised. In all articular operations the application of a tourniquet is of great advantage. The skin of the part is thoroughly cleaned. External wounds are excised as before and temporarily sutured or plugged with antiseptic gauze. This done, fresh instruments, &c., are used and the joint opened.

Arthrotomy and "esquillectomy."—Arthrotomy is not at this stage a procedure of drainage. Various methods have been advised, from simple enlargement of the original wound to the routine practice of an extensive incision such as a semilunar arthrotomy in the knee-joint. Although it is essential to make an opening of sufficient size to examine the lesion completely and methodically and to avoid unnecessary bruising of the synovial membrane by manipulation, it is unjustifiable to open up susceptible surfaces to the danger of further infection or to cut through important ligaments unless the position of the foreign body or fracture definitely demands. If preliminary excision has been carefully performed, it is immaterial whether the original wound be included in the incision or not.

The joint is subjected to a mechanical cleansing. Foreign material and fragments of bone are carefully removed. Should the projectile lie in an osseous cavity, extraneous organic material, clothing, &c., are apt to remain in the bed after its withdrawal. Hence the potential source of a focus of osteitis, which is the more likely to spread as fissures so frequently radiate from this centre. The cavity is therefore curetted until the superficial infected spongy tissue, usually infiltrated with blood and of blackish colour, has been completely cleared away and cancellous tissue of normal aspect, bleeding uniformly, has been reached. Incidentally, the scrapings yield a growth of micro-organisms on culture, whilst the cavity after treatment is sterile. During these manipulations the rest of the synovial cavity should if possible be packed off with gauze as in an abdominal operation, to avoid unnecessary infection of the general sac. Synovial membrane which has been bruised by the passage of the projectile is also found to harbour micro-organisms, and should be removed, the gaps being sutured afterwards. The joint is then washed out with saline solution or with an antiseptic such as brilliant green, which is comparatively harmless to the tissues.

Cavities in the bone may be packed with iodoform to induce hæmostasis and as an additional antiseptic measure; but the mechanical cleaning, removal of clothing, blood clot, &c., is of far greater importance than the application of antiseptics.

The synovial membrane is sewn up completely with absorbable material. In certain cases it is possible in sewing up to eliminate an osseous lesion from the general sac and so provide for its drainage outside the joint. If a gap remains in the synovial membrane it may be possible to improvise a covering as before. When the superficial tissues are sewn, it is wise to leave a drain as far as the synovial wound for 48 hours.

Although the establishment of a path to the exterior is dangerous, some surgeons recommend a routine drainage on the joint itself for 24 or 48 hours after operation. This is unnecessary, except in doubtful cases where it may be advisable to establish a temporary arthrostomy as a safety-valve. There may be no alternative when the gap in the synovial membrane is too wide for suture. Needless to say, a joint thus open should be dressed subsequently with a scrupulous regard for asepsis.

Resection.—The French have applied the convenient term "esquillectomy" to the removal of fragments and curetting of cavities of bone. To decide in which cases esquillectomy should be replaced by a typical resection is one of the most difficult questions in the surgery of joint wounds. Many French authorities have been in favour of an extensive application of treatment by primary resection. Leriche considers that esquillectomy is only suitable for small parietal fractures, and that any considerable fracture involving a solution in continuity of the articular surface demands a typical resection of the joint. Undoubtedly it is preferable, in any case which will definitely require resection sooner or later for orthopædic reasons, to resect at this early stage in order that the sources of infection may be removed and orthopædic demands satisfied at the one operation. Indications of this nature vary according to the joints affected and will be referred to later under their individual headings. But, regarded purely as a prophylactic measure to prevent infection, primary resection is proved by the excellent results of esquillectomy to be too radical in the large majority of cases

When it has been decided to resect a joint, however, the operation should generally conform to type as far as possible, with due regard to the removal of a sufficient portion of the extremities of bone and the preservation of capsule, periosteum, and important extra-articular structures. For instance, in a wound involving serious comminution of the femoral condyle without fracture of the tibia it is useless to preserve the articular surface of the latter and so delay the union of the bones.

Amputation.—Amputation as a primary measure is indicated by extensive wounds of the limb, or the combination of a joint wound with an extra-articular lesion of grave importance, such as rupture of the popliteal artery and vein. The presence of wounds in other parts of the body likely to lower the general powers of resistance to articular infection may decide in favour of amputation. During a stress of work, when the continued application of careful after-treatment is a doubtful possibility, amputation may be practically preferable in certain cases. The upper limb should never be amputated unless there is absolute necessity. In the lower extremity an amputation stump is of more functional value than a limb greatly shortened by extension resection.

Primary treatment in doubtful cases.—There are occasions on which the exact line of treatment is not definitely indicated; it is perhaps difficult to decide whether a given lesion demands resection of the joint or whether a more limited procedure will suffice to eliminate infection. In these cases the more conservative measure may be combined with a temporary *arthrostomy*—made *de novo* or adapted. Should the course be unfavourable, this latter will afford a safety outlet, and secondary suture may be applied at an early stage should all go well. The same line may be adopted where primary treatment has for some reason or another been too long delayed. To effect arthrostomy an original wound (preferably an exit wound) may be left unsutured after excision of its edges; a gap may be left in an operative incision; or a special opening may be made. In the case of the knee, Fieux suggests the following technique: a crucial or T incision is made into the upper and outer quadrant of the supra-patellar pouch (frequently this merely implies the modification of the upper end of an arthrotomy wound). The corners of synovial membrane are sutured to the skin with the object of shutting off periarticular tissues as far as possible. The limb is immobilised and raised. On the fourth and fifth day, if infection does not develop in the joint, the synovial edges are released and sutured together; the joint is thus completely closed.

After-treatment.

Constant clinical supervision and—should doubt arise—frequent pathological observations are essential. The onset of septic arthritis or osteomyelitis is always possible and demands further treatment of early application. All cases exhibit a certain degree of pyrexia for the first day or two; this need give no cause for alarm. But a progressive pyrexia and rising pulse-rate, together with a continuation or increase in the local signs of inflammation, will determine a change of attitude, especially when doubt is confirmed by pathological investigation.

For the first few days all cases should be rigidly immobilised. Many French surgeons strongly advocate the use of plaster-of-Paris in the form of "appareils plâtrés à anse." In our hands it has not been generally successful in the early treatment of wounds, and so great an authority as Colonel Robert Jones advises that it should be discarded altogether.

When the object of treatment is mobility, and the asepticity of a case has been provisionally established—i.e., after the temperature has been normal for about a week—light movements are applied. Further treatment in this direction is regulated by absence of reaction and

comparative freedom from pain. When the object is ankylosis immobilisation for a longer period is obviously necessary; due regard should be paid to the position of election. The treatment of these cases by arthroplasty or resection may be considered at a later period. On the other hand, a flail limb may require fixation by securing ankylosis.

Where the progress of a wound is practically aseptic after operation the dressings should not be changed more than is strictly necessary. The exposure of a clean wound is always a risky proceeding under present conditions unless very special precautions are taken.

Post-operative transport should be delayed as long as the military situation allows.

Secondary Treatment.

This applies to the treatment of septic arthritis and osteomyelitis; it is essentially a curative measure designed to deal with established infection, as opposed to primary treatment which is prophylactic in aim. As such, secondary procedures are required in those cases which have been ill-advisedly subjected to expectant treatment and in those where primary operation has failed to eliminate entirely the sources of infection. The available methods are:—

1. Strictly conservative measures, with the object of localising the inflammation.
2. Aspiration, which may be combined with irrigation or the injection of antiseptics.
3. Secondary arthrotomy, esquillectomy, synovectomy, and suture.
4. Drainage by tubes.
5. Arthrostomy, more or less extensive, combined with treatment by Carrel's method, salt packs, &c.
6. Secondary resection.
7. Secondary amputation.

The importance of pathological control in selecting the form of treatment is again emphasised; the issue at stake is now more immediately serious and vital.

It is not my intention to discuss the respective merits and details of those methods, as my experience of wounds at this stage has been limited. Suffice it to say that the functional results are so unhappy as to accentuate the importance of primary treatment.

Amputation, the ultimate measure of defence, should not be too long withheld, especially in the lower limb where its consequences are less serious and the results of delay so frequently disastrous. Provided the general condition is good, however, pyrexia alone does not warrant amputation. The pulse affords a far more definite indication of decreasing resistance which may be further anticipated by pathological observations. *Cæteris paribus*, the longer the duration of the wound the more radical should be the treatment, as the patient is less able to endure the prolonged convalescence demanded by the more conservative methods.

INDIVIDUAL JOINTS.

The Knee-joint.

Adequate primary treatment is of special importance in this joint, of which the complexity renders secondary treatment peculiarly difficult, and thorough drainage, irrigation, or aspiration practically impossible. The diaphragm formed by the ligamentum mucosum and the ligamenta alaria almost separates the joint into two cavities, each of which is again partially subdivided—the one by the cruciate ligaments and their synovial covering, the other by the upper border of the patella where it lies in contact with the femur. Apart from these divisions, there are the various ramifications and cul-de-sacs, such as the popliteus bursa and the post-condyloid synovial pouches.

The anatomical arrangement complicates *diagnosis* in certain cases. The suprapatellar pouch is of varying extent, although it usually extends two inches above the patella; on rare occasions it fails to communicate with the main joint cavity. Hence it may be difficult to decide whether a foreign body or a fracture in the lower part of the thigh directly involves the main synovial sac. Other bursæ vary in the same way as regards their continuity with the joint. The bursa between the patellar ligament and the tubercle of the tibia is almost invariably separate. A missile may traverse the infrapatellar region or even penetrate to a considerable distance without perforating the synovial membrane. Similarly the joint may escape penetration by a fragment which remains lodged in the posterior cruciate ligament.

In these doubtful cases it is wise to assume in the first place that the foreign body or lesion is outside the joint lest the latter should be unnecessarily opened. Careful preliminary excision of the track of the wound is a safeguard against this possible danger.

Pus may escape from the suprapatellar pouch into the fascial planes of the thigh in septic arthritis; it frequently tracks along the popliteus bursa into the calf.

Immobilisation of the knee is effected by a Thomas's knee splint or one of its modifications. Slings made of perforated zinc add stability and greatly facilitate dressing without disturbance of the limb. Local splints may be applied in combination with the Thomas's to afford additional security. A foot-piece obviates rotatory movement and foot-drop. The whole limb is suspended when possible.

As in other joints, *exploratory arthrotomy* is conducted by an incision which affords a minimum degree of mutilation consistent with a free exposure of the intra-articular lesion. Operation by an insufficient incision can only lead to unnecessary traction and bruising of the synovial membrane. The position of the lesion may admit of treatment by excision and enlargement of the original wound. In many cases a simple form of arthrotomy will suffice, e.g., a long vertical incision half an inch from the patella on the inner or the outer side; suprapatellar, lateral or posterior incisions. When a more extensive exposure of the interior of the joint is required, it may be necessary to perform a semilunar arthrotomy or a median arthrotomy by vertical section of the patella. The latter route would seem to afford less risk of exposure to fresh infection and a better functional prognosis than the semilunar method, in which the patellar ligament is transversely divided. Certain surgeons have advocated the routine employment of a semilunar incision in all cases, to provide for complete examination of the joint; but the risk is considerable, and, in the large majority of cases, unnecessary.

Serious comminution of the *patella* is treated by a primary excision of the bone, preferably subperiosteal; the joint is cleaned, and the synovial membrane sutured as far as possible. Minor fractures are treated by esquillectomy, the joint cleaned if penetrated, and the remaining fragments united by suture of the periosteum and ligaments, or by encircling the bone. In many cases the patellar lesion is merely an element of an extensive articular fracture; the whole bone is then removed in the course of a resection of the joint.

Primary resection of the knee is indicated in those cases in which the separated fragments of bone are so extensive as to render the future of the joint functionally hopeless. There is no object to be gained by conservative treatment unless the general condition of the patient is unfavourable for a severe operation. Fractures of this type afford a great potentiality of serious osteomyelitis, and it is therefore advisable to eliminate widely the sources of infection by resection and at the same time to hasten the inevitable ankylosis. Reference has already been made to the question of *amputation* of the lower limb. In both these forms of operation measures should be taken to combat shock by nerve-blocking and by saline infusion, &c.

Much has been written about the *secondary treatment* of knee wounds. Some surgeons claim good results from simple drainage. Ohutro has successfully applied Carrel's method. Others open the joint widely, turn back the patella, remove the semilunar cartilages, and divide the lateral and cruciate ligaments; a position of flexion is maintained until infection is subdued, and the joint is resected or merely extended at a later period. Chaput advocates drainage by patellectomy. Fullerton has had good results from resection with wide separation of the bones. Ballance advises resection with removal of the sharp posterior margin of the sawn condyles, in order that drainage of the intercondylar and post-condyloid pouches may be established. Yet another school resorts to early secondary amputation where more conservative measures, such as aspiration or simple arthrostomy, fail to establish drainage.

Other Joints.

The Elbow.—In the elbow it is practically impossible for the synovial membrane to be wounded without associated injury of bone. Wounds of this joint are less dangerous, however, than articular fractures of the knee; in the event of septic arthritis, it is possible effectively to establish drainage as a rule, and amputation—a catastrophe in the upper limb—is rarely necessary. At the same time, the local result is frequently unsatisfactory, and ankylosis or flail limb is only too common. Of the two, ankylosis in a good

position is the more profitable. *It is therefore advisable to err on the conservative side in removing bone.* When a typical resection is definitely indicated, every attempt should be made to preserve the periosteum and capsule as far as possible. Arthrotomy, whether primary—to be followed by suture—or secondary, for purposes of drainage, may be effected by excision and enlargement of the original wound; by incisions on either side of the olecranon, preferably the outer; by division of the external lateral ligament; or by subperiosteal removal of the olecranon process.

Fixation in a flexed position is generally desirable. Early movement should be applied where the evolution is aseptic. Inevitable ankylosis is met by securing the joint at an angle of 100° or otherwise as the patient's occupation indicates.

The Shoulder.—Complete resection of the shoulder is also followed frequently by very considerable limitation of movement, especially when the function of the deltoid has been impaired by inflammation or by loss of tissue. Ankylosis is again preferable to a flail limb, and economical removal of bone fragments is better on the whole than typical resection unless the latter is definitely indicated by serious comminution in the early stages or urgent need for radical drainage later. Drainage operations should take into account the subscapular, bicipital, and infraspinate synovial protrusions. Posterior, and especially external, incisions endanger the circumflex nerve, although the former are frequently necessary. Occasionally a foreign body lodged in the head of the humerus may be removed through an osseous channel without opening the joint. A form of triangular humerus splint may be applied to the treatment of shoulder wounds. The position of election for ankylosis is abduction (50°), with slight flexion and internal rotation of the arm.

The Wrist.—The tendency of the carpal bones to necrose and the complexity of the synovial cavity and tendon sheaths in the neighbourhood of the wrist render the treatment of established infection difficult as in the knee-joint. Although the results are less dangerous, the restoration of function is at least as important economically in the former. *Primary treatment is strongly indicated*, in spite of a natural tendency to neglect wounds of less vital importance during the early stages of evacuation. Unless the wound is comparatively innocuous and likely to respond to conservative treatment, a long dorsal incision is made between the tendon of the extensor longus pollicis and that of the extensor indicis, or on the inner side of the joints if more convenient. Osseous fragments are removed and fractured carpal bones enucleated. Complete resection may be required for satisfactory drainage at a later stage. Retention in a position of dorsiflexion is indicated in view of the possibility of ankylosis, but in favourable cases early movement should be practised.

The Hip.—Wounds of the hip-joint are frequently accompanied by lesions of more immediately vital importance, such as abdominal or seriously infected buttock wounds. On account of the comparative anatomical simplicity of the joint itself the ultimate establishment of satisfactory drainage, whether by arthrotomy or resection, is fairly certain. It is therefore advisable to withhold resection during the early stages of evacuation, as the operation is severe and the necessary post-operative fixation cannot be adequately applied during transport. Excision of the wound, posterior drainage or Carrel's treatment, represent the primary measures. Disarticulation is exceptional. Jones's abduction frame provides a satisfactory form of splint. A position of extension with slight abduction and outward rotation of the thigh is assumed in case of impending ankylosis.

The Ankle.—Astragalectomy is said to have afforded good results in wounds of the ankle that fail to respond to the more conservative measures. In severe wounds amputation should not be withheld; it guarantees a safe result and inflicts a comparatively inconsiderable disability in return.

In general, wounds of joints are classed with the more dreadful injuries of war; but in no other branch of military surgery may so great an individual and national benefit be derived from thoughtful treatment.

I am greatly indebted to Captain Lazarus-Barlow and Captain Adrian Stokes for pathological suggestions, to Captain S. Littlewood for notes on late treatment, and to Sergeant Shirley, R.A.M.C., for expert advice in radiography; also to the authors, chiefly French, of recent publications referring to this subject.

OBSERVATIONS ON

DIRECT TRANSFUSION OF BLOOD, WITH A DESCRIPTION OF A SIMPLE METHOD.

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TREATMENT by direct transfusion of blood has attracted much attention of late during the course of the war, since benefit has been obtained by it in many cases of hæmorrhage and in certain cases of anæmia secondary to sepsis. Lives have been saved when all other methods of resuscitation have failed. In many cases the effect has been immediate and dramatic. We have seen patients who were blanched and shocked and with a pulse hardly perceptible brought back to life in a most astonishing way, and we believe that the method ought to be used much more widely than is the case at present. At the same time, we do not recommend its indiscriminate use, and we ourselves have only resorted to it in cases which we considered desperate.

Indications.

After a rapid and moderately severe hæmorrhage, the main indication is to administer fluid (to restore the normal blood volume), and this can quite readily be accomplished by the introduction of saline solution into the circulation. If, however, the hæmorrhage has been very severe, if it has been recurrent, or if it has taken place in a patient already anæmic as the result of prolonged sepsis, the hæmoglobin content of the blood may be reduced to a level below that sufficient to maintain life. Under these circumstances saline fails to produce the desired effect, inasmuch as it cannot supply other essential elements of the blood, such as hæmoglobin.

As the result of our present experience, we believe that when the hæmoglobin falls to 20 per cent. or lower, transfusion is imperatively indicated, as the anæmia due to a percentage so low as this is sufficient of itself to cause death. If the percentage remains between 20 and 30 for any length of time, the anæmia is still dangerous, and transfusion of blood ought to be performed. With a percentage between 30 and 40 the indications are less clear, but there can be no doubt that an anæmia of this intensity lowers the patient's resistance to infection. In a patient, therefore, with this degree of anæmia accompanied by severely septic wounds we are of opinion that blood transfusion may often be resorted to with advantage.

Blood with a percentage of hæmoglobin of 40 appears to be sufficient to carry on full oxidation in a patient at rest in the recumbent position. It must be remembered, however, that transfusion accomplishes something more than the introduction of red corpuscles into the circulation. The introduction of fresh leucocytes and the ordinary protective substances of the blood plasma may be, apart from the supply of hæmoglobin, of service in certain septic cases. Reports from surgeons[1] in the war area show that improvement in the condition of septic wounds has taken place as the result of transfusion, and our experience in several cases bears this out. For this reason we think that even when the percentage of hæmoglobin is 40 or over improvement in the condition of patients who are septic and anæmic may still be expected from transfusion.

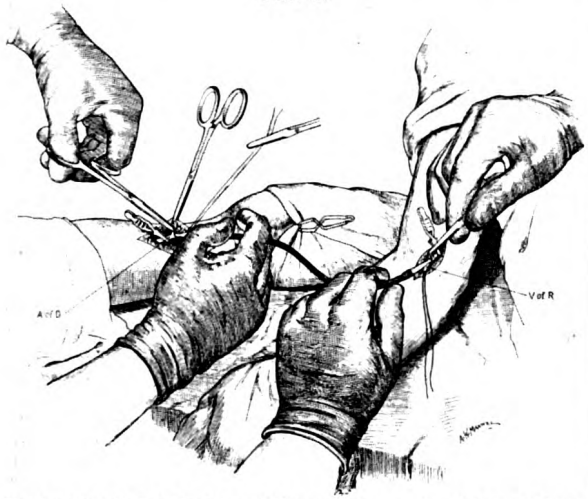
When the anæmia is secondary to sepsis, it may be regarded as an indication of a process of deterioration taking place in the blood. If benefit is derived from transfusion under these circumstances it is reasonable to suppose that this is due to the protective substances of the transfused blood rather than to the hæmoglobin. This contention was supported by a few observations on the bacteriolytic power of the blood of several of our patients after transfusion, which were kindly carried out by the late Captain Tanner. The hæmoglobin given to the patient can be readily demonstrated and accurately measured, but the other elements of the blood are less easily controlled or investigated, and little is known of their persistence under the abnormal physical conditions obtaining as a result of the various methods of transfusion that have been employed. For this reason we consider it important to carry out transfusion under conditions as physiological as can be obtained, so that destruction of leucocytes or protective substances may, so far as is possible, be avoided.

Selection of Donors.

No difficulty has been experienced in finding donors without causing wastage to the Army. Men who are unfit to return to their units for some weeks on account of some slight injury (such, for instance, as a sprained ankle) are generally quite willing to give blood to a wounded comrade.

The donor should, of course, be carefully examined and interrogated so as to exclude the possibility of using men suffering from such diseases as tubercle or syphilis. We have not considered it necessary to examine the compatibility of donor and receiver from the point of view of agglutination and hæmolysis, as the conclusions to be drawn from these tests are by no means definite. In addition, septic cases often show auto-agglutination, thus rendering the tests unreliable. The dangers of transfusion (hæmolysis, agglutination of corpuscles, or symptoms similar to those of

FIG. 1.



Illustrating the introduction of the cannulæ. A of D, Artery of donor. V of R, Vein of receiver.

anaphylaxis) can to some extent be avoided by carefully observing the effect of transfusion in the recipient during the operation. American writers[2] with wide experience do not consider that the risks of a fatal result from transfusion exceed 1 or 2 per cent., even if donors not related to the recipient are used and blood tests are not previously employed. Under the conditions obtaining in warfare we consider it justifiable to take risks so relatively small.

Description of Method.

Transfusion is effected from a small artery to a suitable vein. The apparatus used consists of two glass or silver cannulæ connected by a short length (about 7 inches) of indiarubber tubing, the whole being coated within and without by a thin layer of wax made by mixing hard and soft paraffin. Paraffin has been widely used for the prevention of clotting for a long time, but Saxton Pope[3] has recently described a method of using rubber tubing coated with a mixture for direct transfusion in man. The technique here described is an elaboration of a method based on his, our own, and others' experience.

We use thin-walled, transparent, indiarubber tubing which will stand heat and which will allow pulsations to be easily felt during the operation. The paraffin mixture consists of about equal parts of the constituents, or these should be mixed in such proportions as to set at a temperature between 43° and 48° C., the optimum being about 45°. This mixture may be used again and again, but should be strained occasionally to ensure its freedom from solid particles. The rubber tubing can be used several times, if necessary, but it is preferable to renew it for each operation. Before coating the cannulæ and tubes should, of course, be absolutely clean and dry.

Coating is effected by immersing the apparatus in the paraffin mixture in a bath, the temperature of the mixture being kept at about 130° C. Sterilisation of the cannulæ and tubes is thus effected. The connected cannulæ and tubes are allowed to fill with the mixture, care being taken to avoid air-bubbles. The apparatus is then held vertically by seizing the smaller cannula, and the fluid is allowed to run out of the end of the larger. The last drops are removed by drawing the end of the dependent cannula lightly across sterile gauze. The coating is allowed to set, and the tubes are then wrapped in sterile material, ready for use. They may, if desired, be placed in a sterile test-tube of the requisite length, which is then carefully plugged. If the tubes and cannulæ are coated in this way no clotting need be anticipated, as in experiments on animals no clotting has been found after 2½ hours.[4] Should clotting take place it will be found to be due to excessive injury to the vessels, especially the artery, or to damage to the coating of the tubes from rough handling. The small orifices of the cannulæ are then quickly blocked and the flow ceases. All that is necessary in this event is to replace the apparatus with another which should always be at hand.

The cannulæ we have found most useful are those shown in Fig. 1. They are silver[5] with a bulbous end so as to ensure their retention in the vessels without the necessity of tying or holding them in. Glass cannulæ of similar size and shape may be used. The ends of these are bevelled by grinding on stone or brick to facilitate introduction. They have the advantage of being easily improvised in any ordinary clinical laboratory, but it is difficult to make a bulb of suitable size to fit tightly into the vessels, and they therefore require to be retained by ligature or by holding them in—a most tiresome process. The dimensions of the cannulæ are as follows:—Arterial cannula: Length, 4 cm.; external diameter at point, 2 mm. Venous cannula: Length, 4 cm.; external diameter at point, 3 mm.

Operation

A glance at the diagrams (Figs. 1, 2A and 2B) will give a good idea of the steps of the operation.

The patient and the donor are placed side by side on beds or tables at a suitable distance apart, so that there may be no tension on the tubes. A small table, or a board of suitable size, may be placed between the beds or tables so as to allow the limbs to be placed in position. The limbs

FIG. 2A.

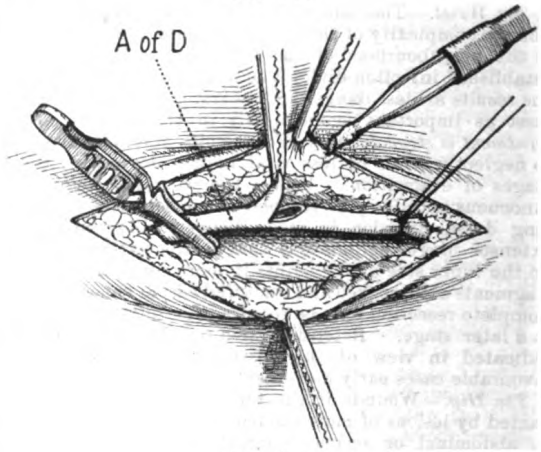
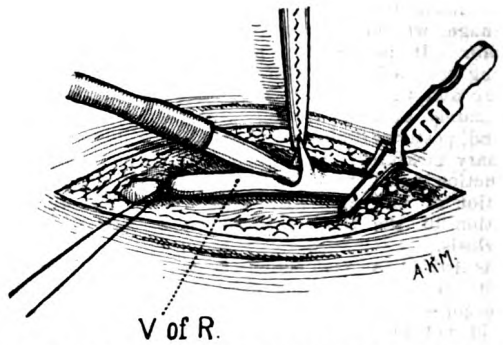


FIG. 2B.



Illustrating on a large scale the introduction of the cannulæ.

should be placed parallel and as close together as convenient. We have found the radial artery of the donor the most suitable to use, and in the recipient one of the veins at the bend of the elbow or the internal saphenous of the leg.

Local anæsthesia is used and the radial artery of the donor and the selected vein of the recipient are dissected out. The instruments for each ought to be kept separate and the operators, two of whom are necessary, ought to keep each to his own vessel to minimise the risk of infection being carried from recipient to donor. The artery must be

carefully dissected and all unnecessary trauma avoided. Rough handling may cause spasmodic contraction of the vessel and difficulty in introducing the cannula. In addition, unnecessary damage may produce clotting. When both vessels are exposed they are ligated at their distal ends and a *light* bull-dog forceps is placed on the proximal end of each. A V-shaped incision is then made with sharp scissors into each vessel. The scissors must be sharp right up to the points, as otherwise the vessel is liable to be crushed instead of cut. If the incision is made close to the ligature, tension on the latter tends to make the opening gape, and facilitates the introduction of the cannula. If the flap made by the incision in the vessel is seized at the extremity with a fine forceps, the introduction of the cannula is still further facilitated. The arterial cannula (the smaller) is then introduced and the bull-dog forceps released for a moment to allow the apparatus to fill with blood and expel air. The forceps is then replaced and the venous cannula introduced. Both bull-dog forceps are then removed and the blood allowed to flow.

Care must be taken to avoid kinking of vessels or tube. Arterial pulsations can be felt through the thin rubber tube and in the receiving vein. Under suitable conditions, the rubber tube will vibrate with each pulsation. If for any reason it is desired to arrest the flow of blood temporarily, this should be done by reapplying the bull-dog forceps to the artery and not by compressing the rubber tube, as this is liable to damage the paraffin coating. At the end of the operation the vessels are tied proximate to the injured part and cut between the ligatures. The stitches for closing the wounds may with advantage be passed before the effect of the local anæsthetic has passed off. They then only require to be tied at the end of the operation.

If a patient is suffering from anæmia as a result of a secondary hæmorrhage and requires amputation (e.g., through the thigh) it is usually better to transfuse him before amputation rather than after. If the transfusion is performed after the patient has gone back to bed or when the operation is completed and the dressings applied vessels which were invisible at the time of the operation may begin to bleed when the blood pressure rises. On the other hand, if the transfusion precedes the amputation, the rise in blood pressure will ensure that any vessel likely to bleed will do so while the patient is on the operating table. In this way every bleeding point can readily be detected and dealt with.

Determination of Amount of Blood to be Given.

The amount given should be regulated by the condition of the donor and that of the recipient.

The onset of anæmic symptoms in the donor indicates that he has lost as much blood as he can conveniently afford. In a man of average weight these symptoms will arise when he has lost about 1000 c.c. (1¾ pints), if the loss has been at the usual rate. The onset of the symptoms is dependent on the loss of from 20 to 25 per cent. of his total blood volume.*

In practice 600 to 1000 c.c. will be found a liberal allowance, and we have only once exceeded this amount. Robertson[6] recommends a similar amount. During the course of the transfusion the donor complains of nothing abnormal until from 10 to 25 minutes have elapsed, according to the rate of flow. The onset of symptoms (faintness, thirst, and pallor) is rather abrupt, and should be taken as an indication for stopping transfusion. These symptoms may be intensified immediately after transfusion has stopped, but they soon subside and never give rise to anxiety. The donor's head should be kept slightly raised during the operation in order to observe more easily the first sign of faintness. If the loss of blood has been slower than usual the symptoms of anæmia will arise at a correspondingly later period. If the donor shows no sign of anæmia the inference is that no blood or an insufficient amount has passed. This may be due to thrombosis or obliteration in the receiving vein (as happened in one of our cases). If there is no block in the apparatus a fresh vein should be selected and the operation continued until some sign is visible in the donor.

The symptoms in the recipient that call for cessation of transfusion are rigors, præcordial pain, increase in the pulse-rate, and failure to improve in colour though blood is ascertained to be flowing into his vein. These symptoms have only been observed in two of our cases (Cases 9 and 13). We have never noticed injurious distension of the heart from the increased volume of fluid in any one of our patients. On the other hand, we have seen a venous engorgement of commencing heart failure, which was present before the operation, actually disappear during the process of transfusion, and this we attribute to the beneficial effects of the supply of fresh hæmoglobin.

* This has been ascertained by investigations, as yet unpublished, made on blood volume by one of us (G. D.).

After-history of donors.—We have kept the donors under observation in all cases until we were satisfied that all danger of untoward result was past. Nothing more than the most temporary disability has resulted in any case. The donor is kept in bed for a day or two and is then allowed to get about (if the condition for which he was admitted to hospital warrants it). At the end of a week he is fit, so far as the effect of the loss of blood is concerned, for light work. At the end of three weeks he is fit for full duty. In the cases in which we have investigated the blood, we have found that the hæmoglobin percentage begins to rise rapidly about the fourth day. This rapid rise continues for some days and is then followed by a more gradual rise until at the end of about three or four weeks the percentage is practically normal.

Benefit of Transfusion.

The main advantages of the method we have just described are its simplicity and the fact that the instruments required for the operation can be packed into small bulk so as to be capable of being carried in the pocket. The apparatus can, if necessary, be improvised from material to be found in any clinical laboratory. In addition, the transfusion is conducted under conditions as near the physiological ideal as possible. The main disadvantage is that the amount of blood given cannot be accurately ascertained at the time, as can be accomplished by the use of Kimpton's tubes, syringes, &c. We have, however, tried to show that this disadvantage is not of much importance, if attention be paid to the condition of the donor and that of the recipient.

Our main object is to insist on the value of transfusion of blood, and we consider it of relatively little importance by which method it is carried out. Transfusion of blood is a procedure, simple, comparatively safe, and of extreme value in certain cases. If the results about to be mentioned do not look very striking on paper it will be seen that this is due to the fact that only desperate cases have been chosen for this form of treatment, and that we have not considered statistics in our endeavour to give the method a trial even in the most hopeless cases.

The benefits of blood transfusion will vary with the class of case. In a patient suffering from anæmia due to hæmorrhage alone, sepsis being trifling or absent, the effects are likely to be immediate, striking, and permanent. Most cases of primary hæmorrhage fall into this class.

In a patient suffering from a combination of sepsis and anæmia, if the latter is the chief factor, immediate improvement will be apparent in his mental and general condition. Most cases of secondary hæmorrhage belong to this class. The permanency of the improvement will largely depend on whether a further hæmorrhage can be prevented and sepsis controlled.

In a patient suffering from sepsis and anæmia, if the sepsis is the chief feature, and the anæmia secondary to it, little immediate change may be noted. Nevertheless, in a few days very obvious improvement may occur, apparently as the result of the transfusion. The permanency of the improvement here will depend on the ability of the surgeon to combat the sepsis. The transfusion has given him, at any rate, temporary assistance.

Short Summary of Cases.

CASE 1.—Private S., under the care of one of us (H.C.B.). Wounded July 4th, 1916, with high-explosive shell. There was a wound of the buttock involving the bladder. A large piece of shell was firmly embedded in the sacrum. On July 13th an unsuccessful attempt was made to remove the foreign body. On July 14th considerable bleeding from the deep wound took place. Bleeding points inaccessible. July 17th, transfusion of blood. The patient at this time was extremely ill and almost died as the result of being moved to the theatre. Transfusion produced considerable and rapid improvement. Consciousness, which had been almost lost, returned. Respiration and pulse improved, and venous engorgement due to failing heart disappeared. A few hours later, however, bleeding recurred and the patient died.

The hæmoglobin percentage was 33·7 before transfusion and 39·4 immediately after. The patient had recived 400 c.c. of blood as ascertained by subsequent calculations from the hæmoglobin percentages of donor's and recipient's blood, taken before and after transfusion.

CASE 2.—Private W., under the care of Captain Wilkins. Wounded by high-explosive shell on July 3rd, 1916. Head and shaft of humerus on left side shattered. Gas infection. Head of humerus excised on July 5th. Secondary hæmorrhage on July 16th and again (very severe) on July 17th. The axillary artery was found divided and the ends were ligatured. Patient remained very anæmic and was depressed, irritable, and restless. Transfused for 14 minutes on July 21st. Immediate improvement in his colour and in his mental and physical condition took place during transfusion. His wounds rapidly cleaned up and his temperature settled. This improvement steadily progressed and the patient was evacuated to England, some weeks after, looking the picture of health.

The hæmoglobin percentage was 25·3 before the transfusion, 36·2 immediately after, and 42·2 24 hours later. It was estimated that he had received 660 c.c. of blood.

CASE 3.—Private Y., under the care of Major West. Wounded by high-explosive shell on July 6th, 1916. He had his right leg amputated at a casualty clearing station on July 7th. On July 17th he had secondary hæmorrhage from extensive wounds of the left leg. Amputation of the left leg was performed on July 21st. Patient was sent to the base with both legs amputated through the knee-joints. His flaps were septic, he was anæmic, his pulse was 150, and his temperature ranged from 101° to 102° F. As his condition was becoming worse he was transfused on July 29th. There was only slight improvement noticed in his colour during the operation. On the 31st, however, the improvement in his condition was very obvious. His wounds almost immediately began to clean up and were granulating well on his discharge to England on August 17th. His spirits had greatly improved and he had gained flesh.

The hæmoglobin percentage was 22 before transfusion and 38·2 immediately after. It was estimated that he had received 750 c.c. of blood.

CASE 4.—Private R., under the care of Captain Hardy. Acute lymphatic leukæmia. The patient reported sick on July 19th, 1916, with toothache and sore gums, following malaise which had lasted six weeks. Sent to base on July 23rd. Extensive gingivitis and necrosis of upper jaw were found. Leucocytic count of 25,000 (mainly large mononuclears). This had risen to 141,000 on August 7th. The ulcerated surfaces in his mouth were scraped, and this was followed by a fair amount of hæmorrhage. Wassermann reaction negative. The local and general condition became rapidly worse. Transfusion was carried out on August 8th, 1916. The patient's colour improved and his mental condition became brighter. The improvement, however, was only transitory, and he became progressively weaker and more anæmic at much the same rate as before, merely starting afresh from a higher level on his downhill course. He died on August 14th.

The hæmoglobin percentage was 17·3 before transfusion and 28·9 immediately after. It was estimated that he had received 500 c.c. of blood.

CASE 5.—Rifleman M., under the care of Major May. Wounded by high-explosive shell on July 23rd, 1916. His left leg had been amputated at a casualty clearing station. His right knee-joint was infected, and he had multiple wounds of his right leg, thigh, and buttock, also of his right arm and forearm and left arm. The wounds showed no tendency to heal. The patient was anæmic, querulous, and in poor condition when admitted to a base hospital on July 29th. He was transfused on August 9th. Immediate improvement in his colour was apparent, and later his general condition also improved. Amputation was performed for septic arthritis of the knee-joint. He had a large abscess extending from the popliteal space to the buttock on the right side. The improvement in his condition was not maintained, as sepsis continued in spite of all efforts to control it. He died on August 23rd.

The percentage of hæmoglobin before transfusion was 36·3, immediately after 50·9 and 57·2 24 hours later. It was estimated that he had received 750 c.c. of blood.

CASE 6.—Corporal B., under the care of Major West. He came down to the base with a fragment of high-explosive shell lodged in the body of his fifth lumbar vertebra; this was removed on August 21st, 1916. Secondary hæmorrhage took place from the deep cavity on August 31st. Transfusion was carried out on Sept. 3rd. Very little improvement took place, and his temperature, which had ranged between 103° and 104° F., continued high. Death from sepsis took place on Sept. 7th.

The hæmoglobin percentage was 24·2 before transfusion, 30·4 immediately after, and 32·7 24 hours later. It was estimated that he had received 530 c.c. of blood.

CASE 7.—Under the care of Lieutenant Matson. Admitted to a base hospital on July 23rd, 1916, with shell wounds of head and shoulder. Gas infection was present. The shattered head of the humerus was removed on August 1st, 1916. On August 12th blood culture showed 30 colonies of streptococci per c.c. of blood. His evening temperature ranged from 103° to 105° F., and his pulse was weak and rapid. On August 17th he became semi-conscious and began to go down hill steadily. He was transfused on Sept. 3rd. There was slight temporary improvement, but this was not maintained, and he died from septicæmia 24 hours later.

The amount of blood which this patient had received was not determined.

CASE 8.—Private C., under the care of Captain Lock. He was wounded by a bullet in the right shoulder on August 18th, 1916. Secondary hæmorrhage took place on August 31st. The axillary artery was found to be wounded and was ligatured. The patient was now very weak and anæmic. The temperature rose to 103° F., and his pulse-rate ranged from 100 to 128. His shoulder-joint was found to be infected. Gangrene began to appear in the arm on Sept. 3rd. He was transfused the same day, preparatory to proposed amputation at the shoulder-joint. Definite improvement took place, and the operation was carried out on the 4th. His condition remained fairly good till the 5th, when he suddenly began to fail, and death took place on Sept. 6th from sepsis.

The hæmoglobin percentage was 52·2 before transfusion, 57 immediately after, and 58·2 24 hours later. It was estimated that he had received 300 c.c. of blood.

CASE 9.—Lieutenant S., under the care of Major Webb Johnson. He was admitted to a base hospital with a septic wound of his left knee-joint. On August 16th amputation through the lower third of the thigh was carried out for secondary hæmorrhage. On August 18th he had double parotitis. His temperature remained high and swinging and his pulse-rate was usually 120 or over. On August 21st he was much worse and looked thoroughly septic. His temperature had been ranging from 100° to 103° F., and his pulse-rate from 120 to 150. He was transfused at 2 P.M. on the 21st. His pulse-rate before the operation was 136. During transfusion he had rigors and profuse sweating and his pulse-rate increased to 150. The weak, rapid pulse and the rigors lasted for an hour or more after transfusion. At 5 P.M. his condition was good and he felt comfortable. The parotitis, which had been diminishing previous to the transfusion, had completely disappeared by the next day. The high swinging temperature continued, however, and he had much pocketing of pus in the amputation stump. After a very tedious convalescence the patient was transferred to England on Nov. 3rd, 1916, well on the way to recovery.

As a result of further experience we consider that this patient had a definite "serum reaction," and it would have been wiser to have stopped the transfusion on the first onset of symptoms. It is open to doubt that his recovery was in any way due to transfusion. The percentage of hæmoglobin before transfusion was 41·3, and 43·5 immediately after. The amount of blood which he had received was not determined.

CASE 10.—Lieutenant W., under the care of Major Martin. The patient was wounded in the right thigh on August 18th, 1916. Secondary hæmorrhage took place on August 28th. Transfusion was attempted the same day, the vein chosen being the internal saphenous in the leg. Though the rubber tube pulsated, the donor felt no ill-effects, and the patient did not improve. It was subsequently found that the receiving vein was impervious a little higher up, above the seat of operation. The patient died a few hours later.

The patient received *no* appreciable amount of blood. Such a failure should be avoided in future by attention to the condition of the donor, as has been explained in the text. Hæmoglobin percentage before transfusion was 48·7 and 49 immediately after.

CASE 11.—Private E., under the care of Lieutenant A. T. Edwards. He was wounded on July 20th, 1916. On admission to a base hospital he was found to be suffering from a compound fracture of the femur and was in a very septic condition. On Sept. 1st a large amount of pus was evacuated from an abscess in the gluteal region. His condition remained unsatisfactory and amputation was decided on. On Sept. 7th transfusion was carried out preparatory to amputation. The flow was allowed to continue for 12½ minutes. There was an immediate improvement in the colour and condition of the patient. He had, however, a rigor after his return to the ward. On Sept. 8th amputation through the upper third of the thigh was carried out under stovaine spinal anæsthesia. The shock after the operation was very severe, but improvement soon set in and patient was transferred to England in good general condition on Sept. 24th.

The hæmoglobin percentage was 21·3 before transfusion, 36·0 immediately after, and 43·5 24 hours later. It was estimated that he had received 1000 c.c. of blood.

CASE 12.—Private E., under the care of Captain Driberg. Patient was wounded by a bomb on August 29th, 1916. The upper end of the left tibia was injured, the knee-joint was opened, and he had gas gangrene of his left thigh. He had also a penetrating wound of his chest. Attempts were made to save the leg, but amputation was finally decided upon. Preparatory to this transfusion was carried out to fit the patient for the ordeal. The improvement was very obvious, and amputation was successfully accomplished next day. Unfortunately, the patient had a severe hæmoptysis from an abscess cavity in the left lung on Sept. 19th, and died on Sept. 21st.

The hæmoglobin percentage was 33·0 before transfusion, 43·3 immediately after, and 44·3 24 hours later. It was estimated that he had received 400 c.c. of blood.

CASE 13.—Private C., under the care of Mr. John Campbell. The patient was wounded on Sept. 1st, 1916. He had a compound fracture of the upper end of the humerus, and his wound was very septic. The temperature ranged from 101° to 104° F. He had moderate secondary hæmorrhage on the 15th and a more severe attack on the 19th, after which the limb was amputated through the shoulder-joint. His temperature remained high after the amputation, and his anæmia showed no sign of improvement. He appeared to be going down hill gradually. Transfusion was carried out on Sept. 26th. The patient was a Canadian and the donor a healthy Scotchman. For the first two minutes of the flow the patient improved. He then complained of feeling cold and actually shivered. Later, he complained of præcordial oppression, his pulse began to fail, and he became more pallid than he was before transfusion. The operation was abandoned, but the pulse continued to fail, until it finally became imperceptible about 20 minutes from the commencement of transfusion. Respiration continued for a few minutes longer and then ceased. Death occurred about 30 minutes after the commencement of the transfusion. Artificial respiration and the injection of pituitrin failed to produce any improvement. A post-mortem examination was made a few hours later. No sign of clotting could be discovered in the recipient vein, the pulmonary vessels, or the coronary arteries. There was no indication anywhere of embolism or thrombosis. It seems possible that this patient died as the result of "serum reaction."

The amount of blood received was not determined.

CASE 14.—Under the care of Captain Wagstaffe. The patient had suffered for some months from sepsis as the result of a head injury (with cerebral abscess), a compound fracture of the right femur, wounds of the right leg and foot involving the ankle-joint, and wounds of both arms. He had become extremely anæmic, and for several days previous to transfusion he had been in a collapsed condition with no febrile reaction. Amputation of the right leg was performed under local anæsthesia and morphia, and he was then transfused. The symptoms of shock continued in spite of transfusion, which failed to produce any obvious improvement. The patient was outside our area and further details are not available. He died a few days later.

The hæmoglobin percentage before transfusion was 20·9 and 41·7 immediately after. It was estimated that he had received 750 c.c. of blood.

CASE 15.—Private H., under the care of Lieutenant A. T. Edwards. He was wounded on Sept. 29th, 1916 There was a compound comminuted fracture of the tibia, the wound being very foul. On Oct. 6th he had severe secondary hæmorrhage, the loss of blood being estimated at about a pint, before control was effected. Amputation was decided on. On Oct. 7th preliminary anæsthesia was effected by an intrathecal injection of stovaine and glucose. A few seconds later collapse occurred, the patient becoming unconscious, with shallow breathing, dilated pupils, and imperceptible pulse. Artificial respiration was carried on for 15 minutes, when the pulse again became perceptible at the wrist. Amputation was then performed, the patient being still unconscious. He was then transfused. In about six minutes his colour improved and he recovered consciousness. The transfusion was continued for 15 minutes, and the patient went back to bed with a good radial pulse of 88. He continued for some time to have fever, but his condition gradually improved and he was transferred to England, doing well, on Oct. 27th.

The amount of blood received was not determined.

CASE 16.—Rifleman A., under the care of Captain Whittington. He was wounded on July 10th, 1916, by high-explosive shell, a fragment of which lodged in his knee-joint. Attempts were made to save his

joint, but this became septic, and the onset of septicæmic symptoms necessitated amputation through the middle of the thigh. This was carried out on Sept. 24th. There was considerable shock from the operation. His temperature gradually fell until the 29th, when it rose again, and pain was complained of in the left hip. His pulse, which had from the first been rapid, did not improve. On Oct. 10th a large pyæmic abcess was opened in the region of the left hip. The pus contained *Staphylococcus aureus* and a short-chained streptococcus. Immediately after the opening of the abscess, transfusion was carried out, a brother (weighing 10 st.) being used as the donor. The flow was continued for 30 minutes, until the donor suddenly showed very obvious anæmic signs. He had felt symptoms coming on earlier, but in his endeavour to help his brother had not complained. The patient's colour and condition were much improved. This improvement continued for a week or so, but his temperature and pulse began again to rise, and he died from sepsis on Oct. 25th.

The hæmoglobin percentage before transfusion was 45·3, and 67·4 two hours after. It was estimated that the patient had received 1030 c.c. of blood.

Summary of Results.

On analysis of the 16 foregoing cases we find that 1 (Case 10) received no blood owing to an undetected obliteration of the receiving vein. In 3 (Cases 4, 7, and 14) the patients appeared beyond hope of recovery and transfusion was only undertaken as a last resort. Of the other 12 in which improvement might have been anticipated, 4 (Cases 2, 3, 11, and 15) made very rapid and satisfactory progress, which we could have no hesitation in attributing to the transfusion. These cases have recovered or are well on the way to recovery. In Case 9 recovery cannot be attributed to transfusion; he suffered from symptoms during the course of the flow suggestive of a "serum reaction."

The remaining 7 cases are dead, though hopes of their recovery were entertained. Of these cases 4 (Cases 1, 5, 12, and 16) showed decided improvement as the result of transfusion, but this, unfortunately, was not maintained. In 2 others (Cases 6 and 8) slight improvement took place, and in 1 (Case 13) death was probably accelerated by the transfusion. The fact that improvement took place even in most of the cases that died encourages us in the belief that under similar circumstances in future transfusion might just tide the patient over a critical period and allow time and opportunity for further surgical treatment.

As has already been mentioned, a "serum reaction" took place in 2 cases. No serious ill-effects followed in Case 9, but in Case 13 (in which death was probably certain in any case) the final event was hastened.

In addition to the cases mentioned above, there must now be a considerable number in which the method used by us has been tried by officers in our own and other areas. We have given the details only of those for which we are responsible. During the time one of us (A. F.) was doing temporary duty with one of the armies the opportunity was taken of discussing the method with officers of casualty clearing stations in that army. We append a letter from Captain John Fraser, working at one of these clearing stations, and also a communication from Lieutenant A. T. Edwards, working at a base hospital, which we think will help to encourage those who are interested in this subject.

Captain Fraser writes as follows:—

We have had two interesting and successful cases of blood transfusion done with your apparatus. Two officers were wounded by the same shell, both of them in the centre of the upper part of the thigh. Both of them arrived at the casualty clearing station profoundly blanched. One appeared to be dying—no pulse could be detected, and he was scarcely conscious. This case (Case A) was put under light anæsthesia and was found to have complete division of the superficial femoral artery and complete division of the deep femoral artery and vein. The superficial artery was sutured and the channel re-established. The completely divided vessels were ligatured. I transfused blood from the donor—a big Irishman—for 15 minutes, using liquid paraffin (B.P.) as a lubricant. During the whole procedure we had not the slightest hitch, and on removing the tubes at the end of the proceeding no clot was apparent. This officer is making an uninterrupted recovery.

The second officer (Case B) had complete division of the deep femoral artery and vein. No donor was forthcoming and I transfused him with two pints of normal saline. At the end of 18 hours his condition was much worse. The pulse had risen to 160 and his wounds were badly infected. A donor was now obtained and we transfused blood for 22½ minutes. Fifteen minutes after the commencement of the operation the stream was obviously becoming sluggish and I accordingly changed the tubes. Otherwise there was no hitch. Again I used liquid paraffin as a lubricant. This morning officer B has a pulse-rate of 106 and in every way is making an excellent recovery.

Lieutenant Edwards has forwarded notes of a case of secondary hæmorrhage from the kidney which he successfully treated by transfusion of blood, using the method described in this paper.

The patient was wounded in the left kidney by a piece of high-explosive shell on Nov. 25th, 1916. He had severe secondary hæmorrhage on Dec. 24th and was blanched. The affected kidney was removed, and transfusion was performed immediately after. The improvement in the patient's condition was dramatic, and he is now making a satisfactory recovery.

References.

1. Robertson: Brit. Med. Jour., 1916, ii., 38. Archibald: THE LANCET, 1916, ii., 429. Journal of R.A.M.C., November, 1916, xxvii., 636. Primrose and Rutherford: Brit. Med. Jour., 1916, ii., 384.

2. That American authors are not quoted is due to the difficulty of access at present to their extensive literature and not to any lack of appreciation of their work. A full list of the less recent literature on this subject is given by Ingebrigsten, Nordiskt Med. Arkiv., Ab. 1, 1915.

3. Saxton Pope: Journal of Amer. Med. Assoc., 1913, lv., 1284.

4. Experiments not yet published carried out by one of us (H. C. B.) in conjunction with W. C. Quinby, of Boston, U.S.A.

5. All the instruments described may be obtained from Messrs. Down Bros., St. Thomas's-street, London, S.E. They have also been supplied to the Army Base Medical Stores.

6. Robertson, loc. cit.

FRAGMENT OF SHELL EMBEDDED IN THE INTERNAL POPLITEAL NERVE:

ILLUSTRATING THE VALUE OF ACCURATE LOCALISATION.

BY SIR JAMES MACKENZIE DAVIDSON, M.B., C.M. ABERD.,

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AND

P. LOCKHART-MUMMERY, F.R.C.S. ENG.,

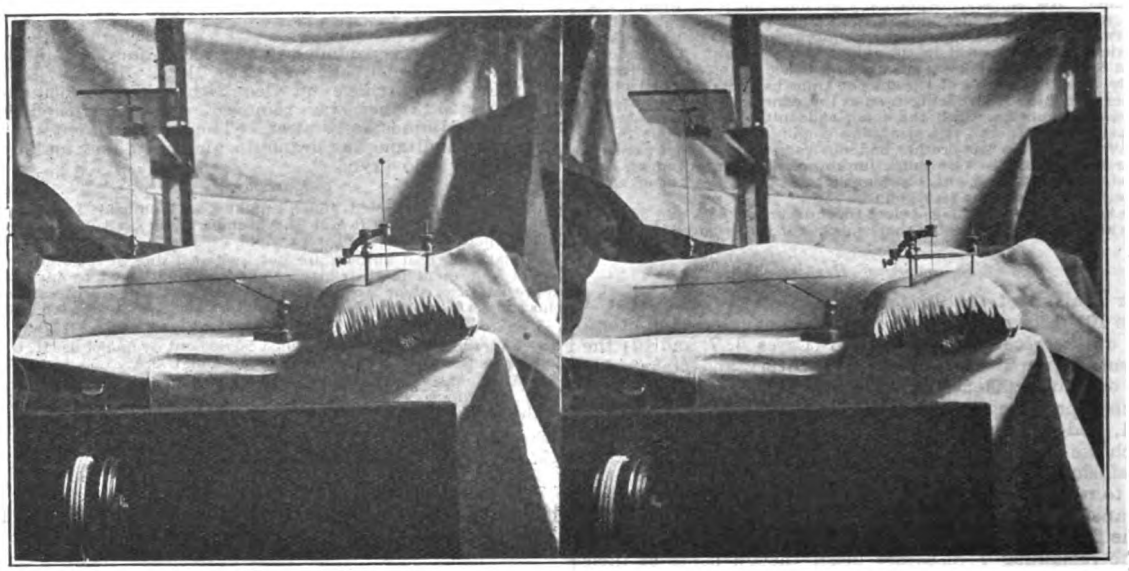
HONORARY SURGEON, KING EDWARD VII. HOSPITAL FOR OFFICERS, GROSVENOR-GARDENS, LONDON, S.W.

THE patient was a second lieutenant, aged 22, who had been hit by two small pieces of shell in the back of the left knee and the back of the left thigh. The wounds healed rapidly without trouble, and there was no sepsis. He was invalided home to the Cliff Military Hospital at Felixstowe, When he began to get about there was acute pain down the inner side of the left leg and foot in the distribution of the left internal popliteal nerve, especially in walking, while any movement of the knee-joint or pressure upon the popliteal space brought on acute spasmodic pain in the nerve. Examination showed a small scar in the popliteal space, and deep pressure at this spot produced acute pain in the nerve; X ray photographs showed a minute fragment of shell deep in the popliteal space. He was then transferred to King Edward VII. Hospital for Officers.

The fragment was localised by Sir James Mackenzie Davidson in the following manner.

The patient was laid prone on the X ray couch, with his toes pointing downwards over the couch-end (Fig. 1). The position was maintained by means of sandbags placed on either side of the leg to be examined. A very small scar on the skin of the popliteal space denoted the point of entrance of the minute fragment of shell which had to be localised, and the cross wires being laid on the part in the usual way their intersection was made to correspond with this scar. Two plates were then exposed, the tube being displaced by 6 cm. for the second exposure, and the localisation worked out with the cross-thread localiser. With the limb in this position the particle of shell was found to be situated at a depth of 30 mm. below the skin of the popliteal space and a mark was placed on the skin by means of nitrate of silver to indicate the point, which was vertically above the position of the foreign body. While the conditions still remained rigid a horizontal line was traced, also with nitrate of silver, along the outer side of the leg by means of a small gauge. This line was parallel with the surface of the couch at a uniform distance of 72 mm. above it and with such an indicator it was possible for the limb to be replaced on the operating table in exactly the same position as it had occupied when the X ray pictures were taken. The surgeon could be sure, therefore, that the conditions under which the localisation was made were exactly reproduced, and that the minute particle of metal was still in a vertical line at the given depth below the marked spot on

FIG. 1.

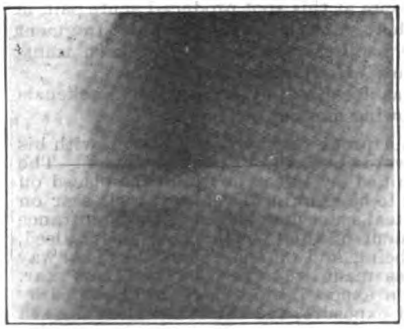


To be viewed in a small stereoscope. The leg in position on the X ray couch. The plumb-bob points to the marked spot on the skin, vertically below which, at a depth of 30 mm., the foreign body was known to be lying. This view also shows, on the sandbag, the special director which was used during the operation in order to keep the position after the original mark had been displaced owing to the incision. The surface gauge is also shown at the end of the black line traced by it along the outer side of the leg.

the skin. As a further precaution the special indicator (already described and illustrated),[1] the purpose of which is to enable the surgeon to refer back to a previously ascertained position after the displacement of the skin mark on operation, was brought into use, so that at any moment after incision the exact direction and position of the foreign body could still be made out.

The operation was performed on Jan. 1st, 1917, by Mr. Lockhart-Mummery, assisted by Captain W. B. Ainger, R.A.M.C., Sir Mackenzie Davidson being present. The patient was put in the prone position, and an incision was made longitudinally over the spot indicated by Sir Mackenzie Davidson. This incision was deepened for about 1½ inches, great care being taken after displacing structures to return them accurately to the plane in which the fragment had been localised. The fragment, which was very small, was reached quite easily, thanks to the accurate localisation, and was found to be embedded in the popliteal vein, one edge of it pressing upon the nerve. The telephone probe was used to verify the foreign body, which was then seized with forceps and drawn out. This resulted in a sudden gush of blood from the popliteal vein through the hole made by the removal of the foreign body which was forming part of the wall. The bleeding was stopped by pressure. In the meantime the wound was sewn up and pressure applied with a wad and bandages. No attempt was made to close the opening in the vein, and no subsequent bleeding occurred. The wound healed quite satisfactorily by primary union. The foreign body proved to be a fragment of shell about the size of the head of a wax vesta.

FIG. 2.



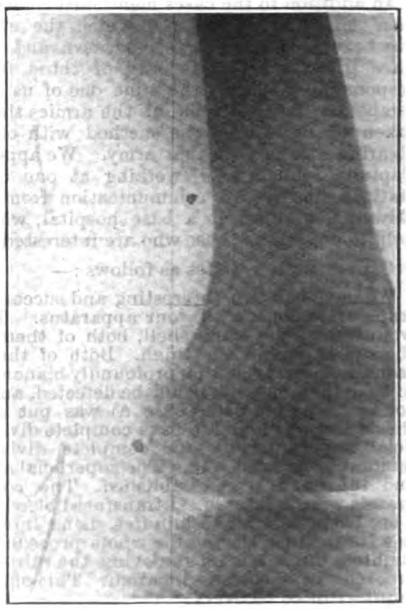
X ray photograph, taken antero-posteriorly, and showing the cross wires and small foreign body.

[1] Surgical Director for Assisting in the Extraction of Localised Foreign Bodies, THE LANCET, 1916, ii., 608.

This case demonstrates not only the importance of precision in the preliminary localisation but also the necessity of ensuring that the part to be operated on is placed in exactly the same position on the operating table as it occupied for the X ray localisation. It would scarcely have been possible to find a small and deeply embedded foreign body such as was concerned in this case had not the surgeon been able to dissect carefully down upon the spot where it was known to be lying. A vague search for such a foreign body could hardly have ended in anything but disappointment, and quite possibly would have been disastrous.

The two plates which furnished the data for this localisation were reduced and mounted as a stereoscopic transparency, and when viewed in a small lenticular stereoscope gave the surgeon a distinct picture in relief. The relative position of the cross wires on the skin and the depth of the foreign body and its relation to the femur were clearly shown, and the surgeon thus had all the necessary information, both the exact measurements and the stereoscopic view, ready to his hand.

FIG. 3.



X ray photograph, taken laterally, and showing two small foreign bodies, lead wires being placed on the scars at the point of entrance. The one nearer to the knee-joint is that which was removed.

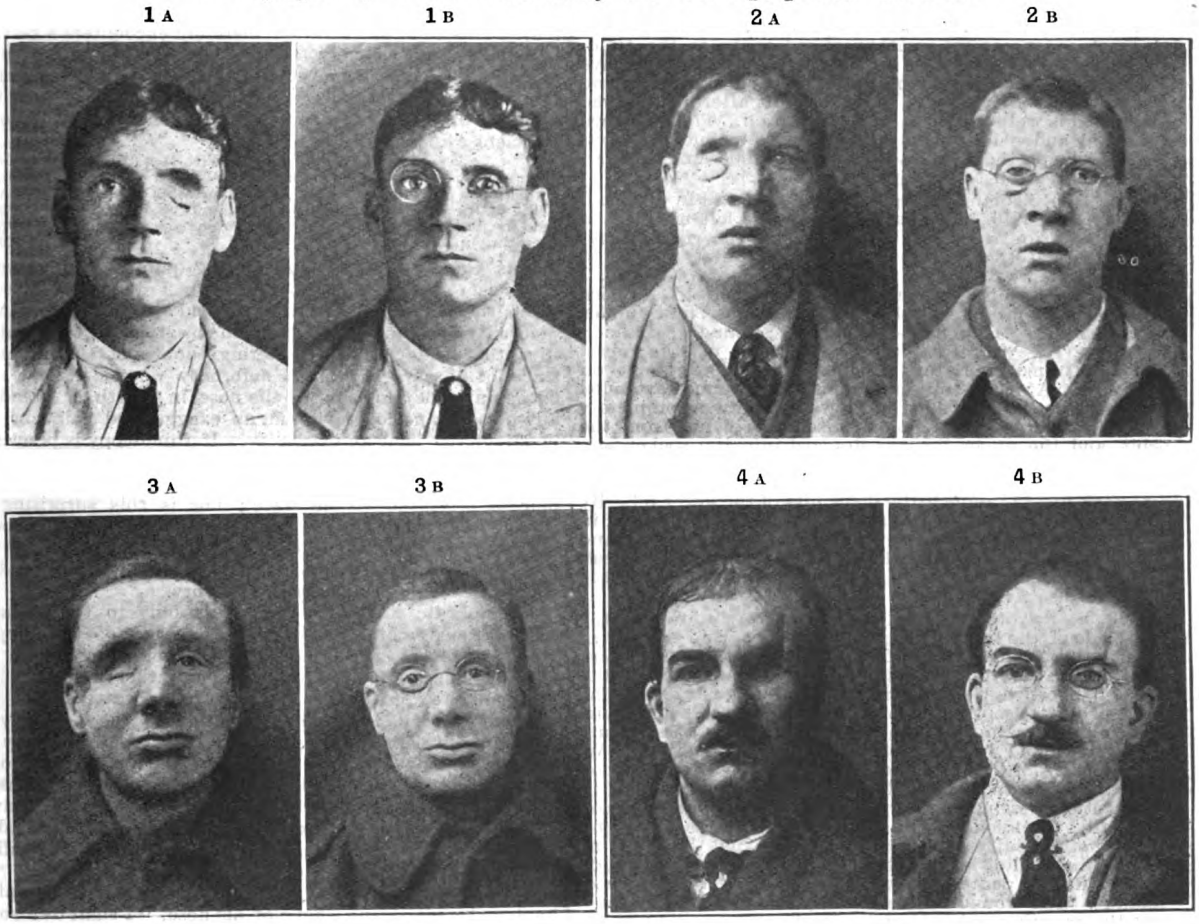
AN OCULO-PALPEBRAL PROTHESIS.

BY A. MAITLAND RAMSAY, M.D. GLASG.,
MAJOR, R.A.M.C.(T.); OPHTHALMIC SURGEON TO THE 3RD SCOTTISH GENERAL HOSPITAL, GLASGOW.

WHEN an eye has been severely burnt by molten metal, by a caustic alkali, or by a mineral acid, it occasionally happens that the lids and orbit are damaged so seriously that the ordinary artificial eye cannot be worn. In such cases I am in the habit of adjusting an ecblepharon fitted to a spectacle frame. There is nothing original in the procedure, for it was known as long ago as the sixteenth century, and Ambroise Paré's works contain not only a description but also an illustration of that form of prothesis. Few references have been made to it in ophthalmic literature, because cases suitable for its use are of infrequent occurrence. The subject has, however, assumed considerable importance at the present time owing to the large number of soldiers who have been wounded in the head and face, and in some of whom the lids and orbit have been destroyed so completely that there is no possibility of the socket retaining an artificial eye. In such cases a carefully adjusted oculo-palpebral prothesis hides the deformity so satisfactorily that the wounded man can move about among his fellows without attention being drawn to the loss of his eye. He avoids, therefore, the annoyance of unnecessary commiseration, and is placed in a much more favourable position for obtaining employment. The æsthetic value of the prothesis is, indeed, great, and it only requires the spectacles to be lifted to reveal the astonishing change in the appearance when the ecblepharon is removed. It goes without saying, however, that the aid of art ought never to be called in until the resources of plastic surgery have been exhausted, because if the socket can be repaired so that an artificial eye can be retained by the lids an infinitely more satisfactory result is obtained than that got from an ecblepharon, no matter how artistic and unrecognisable.

Each eye must be made to suit the individual case, and different materials have been suggested to replace the damaged lids. The most perfect imitation is obtained when the deformity can be covered by an oculo-palpebral prothesis made wholly of glass. Such an ecblepharon mounted on a silver plate and soldered to a spectacle frame is made by Müller, and in suitable cases it is so realistic that it is only detected after attention is drawn to it. Skilled artists in glass are not, however, always at hand, and different makers of the prothesis have mounted the artificial eye in porcelain, in celluloid, in metal, and in various substances having gelatine as a basis The drawbacks as well as the advantages of these different preparations are obvious. In the striking case [1] published by Sir William Collins an extensive deformity was hidden by a copper-plate skilfully moulded and painted, and to this a glass eye was attached. Coulomb and Ruppe [2] advise vulcanite, and this is the substance that I have chiefly employed because of the ease with which it can be moulded and painted to harmonise with the surrounding parts of the face. The parts to be reproduced are carefully modelled in wax, and from the model a plaster-of-Paris impression is taken. The soft rubber is then moulded on the plaster-of-Paris and thoroughly vulcanised. The artificial eye is cemented to the vulcanite lids, and after these have been coloured to match the surrounding parts the prothesis is attached to a spectacle frame. The lens in front of the sound eye corrects any error of refraction which may be present, while that in front of the artificial eye is of the curvature which is found to give the best cosmetic result.

Photographs of Cases Illustrating the Oculo-palpebral Prothesis.



[1] THE LANCET, 1916, i., 1217.
[2] Annales d'Oculistique, April, 1916.

The four soldiers whose photographs illustrate this paper have been provided with the oculo-palpebral prothesis through the generosity of some of the ladies visiting the hospital, I am much indebted to them and also to Mr. John Trotter, of 40, Gordon-street, Glasgow, who has taken great pains in the construction of the ecblepharon, and the photographs show that his mechanical and artistic skill have been rewarded by satisfactory results. The immobility of the prothesis is its most serious drawback, but that is a disadvantage which is also present in many cases where an artificial eye is worn in the socket. It is important that all cicatricial contraction is as far as possible completed before the ecblepharon is adjusted, for if any further shrinking occurs a readjustment of the prothesis is necessary.

CASE 1.—Private ——, aged 26, was severely wounded on the left side of the face by a bullet on July 10th, 1916. He was admitted to the 3rd Scottish General Hospital on August 5th. The left eye had been enucleated and a deep adherent cicatrix extended from the inner third of the lower eyelid downwards and outwards one and a half inches across the malar bone. Both upper and lower eyelids were adherent to the tissues of the orbit and pulled backwards by cicatricial contraction. The scar from the lower lid on to the face being very unsightly, was cut out on Sept. 2nd and the edges of the wound were carefully sutured. Captain John Morton, R.A.M.C. (T.), assisted me at the operation, which, however, was not so successful as it promised to be at the time, owing to the occurrence of secondary hæmorrhage two days afterwards. The pressure of the effused blood caused some of the stitches to give way, and the result after healing was completed is well shown in the photograph. The right eye is healthy and vision equals 6/12, measured by Snellen's test-types. The prothesis was adjusted in October and the man was discharged on Nov. 11th, 1916. (Fig. 1.)

CASE 2.—Rifleman ——, aged 20, was wounded by shrapnel on July 2nd, 1916. The bullet struck the left side of the nose, shattering the nasal bones, tearing the right cheek, and damaging the right eye so severely that it had to be enucleated. He was treated for four days at No. 1 Stationary Hospital, Rouen, and then taken to the 3rd Scottish General Hospital, where he was first under the care of Lieutenant-Colonel T. Kennedy Dalziel, R.A.M.C. (T.), who treated the fracture of the nose. He was transferred to the ophthalmic department on Sept. 6th. At that time a suppurating wound extended across the cheek, and the right lower eyelid was completely everted. There was a copious discharge of pus from the orbit, and the upper lid was dragged into the socket and partially adherent to the underlying tissues. Antiseptic dressings were applied, and on Sept. 30th a plastic operation was performed to remedy the deformity of the lower lid. By the end of October the appearances were as represented in the photograph. The left eye is healthy in structure and function, and vision equals 6/9, measured by Snellen's test-types. An oculo-palpebral prothesis was adjusted and the man was discharged on Nov. 11th. (Fig. 2.)

CASE 3.—Private ——, aged 35, was severely injured on the right side of the head by the explosion of a rifle grenade at Souchez on August 14th, 1916. He was taken to a base hospital, where the right eye was removed, and was admitted to the 3rd Scottish General Hospital on August 20th. The right orbit was septic, the lower lid was torn and sloughing, and communicating with the socket there was a large suppurating wound in front of the right ear. Major J. W. Downie, R.A.M.C. (T.), examined the sinuses in connexion with the orbit and reported that they were not implicated. Antiseptic dressings were applied and the suppuration gradually diminished. On August 31st the patient complained of difficulty in opening his mouth, but there was no trouble in swallowing. Antitetanic serum was injected on three different occasions, but there was never any sign of tetanus. The wounds healed slowly, the difficulty in opening the mouth persisted, and considerable swelling of the face remained over the right superior maxilla. Massage and passive movements were applied to the face and lower jaw, and the swelling and stiffness gradually lessened. By the end of December the wounds had healed, but the orbit was so contracted that an artificial eye could not be worn. An oculo-palpebral prothesis was supplied, and the man was discharged on Jan. 6th, 1917. (Fig. 3.)

CASE 4.—Lance-Corporal ——, aged 25, was severely wounded on the left side of the head by the bursting of a shell near Ginchey on Oct. 22nd, 1916. He says he was taken to the 1st Australian Hospital at Rouen, where the left eye was enucleated and an "abscess" of the orbit evacuated and drained. On Nov. 3rd he was admitted to the 3rd Scottish General Hospital. The orbit was sloughing and a deep suppurating wound extended from it outwards to the cheek and upwards on the forehead, where a large area of the frontal bone was exposed. There was also a deep wound of the left parietal region. The wounds and the orbit were kept clean and treated with antiseptic dressings, and antitetanic serum was injected on three different occasions. Healing was slow but uninterrupted in its progress, and by the beginning of January, 1917, cicatrisation was almost complete. The eyelids were drawn backwards and had become firmly adherent to the tissues of the orbit, and the wounds of the forehead and face were represented by deep adherent cicatrices. An oculo-palpebral prothesis was adjusted and the man was discharged. The right eye is healthy and vision equals 6/6, measured by Snellen's test-types. (Fig. 4.)

Glasgow.

THE SURGICAL CORRECTION, WITHOUT CICATRIX, OF UNLOVELY NOSES.

BY DR. JULIEN BOURGUET (OF TOULOUSE),
ASSISTANT SURGEON, LATE PROSECTOR AND CHIEF OF CLINIC, AT VAL DE GRACE.

To rectify, or correct, unlovely noses and to render them acceptable to the æsthetic sense by means of a surgical operation and without leaving any cicatrix appears at first sight paradoxical, in that every surgical operation involves a scar. This kind of operation therefore encounters a certain incredulity, not merely among persons unfamiliar with surgery, but even amongst a number of colleagues. The following letter sent to me last year by the chief of the Medical Clinic at the Faculty of Medicine in Toulouse is sufficient evidence of this.

With the Forces, June, 1916.

On my speaking with colleagues at the field hospital of your nasal corrections without scar they gave expression to a certain doubt. Being desirous of convincing them I should be obliged if you would send me photographs of the cases that we have had the opportunity of operating upon together. D. PUJOL.

This kind of plastic surgery being quite a novelty, such scepticism is scarcely surprising. In France we have to reach the point of correcting any and every case of nasal deformity by operating in the endonasal passage, and it is thus that the cutaneous covering shows not the slightest trace of a scar. By nasal deformity we understand any exaggerated development of the nose in length or breadth, any protuberance or deviation, an exaggerated point, or too broad or too long an extremity. If rhinoscopy is practised after rectification doubt may often arise whether the bistoury has actually been used, for the incision in the mucosa leaves no visible trace; nor is this surprising to rhinologists, who are well aware that after submucous resection of the nasal septum with consecutive suture the area of incision is identical afterwards with other parts of the mucosa not touched by the bistoury.

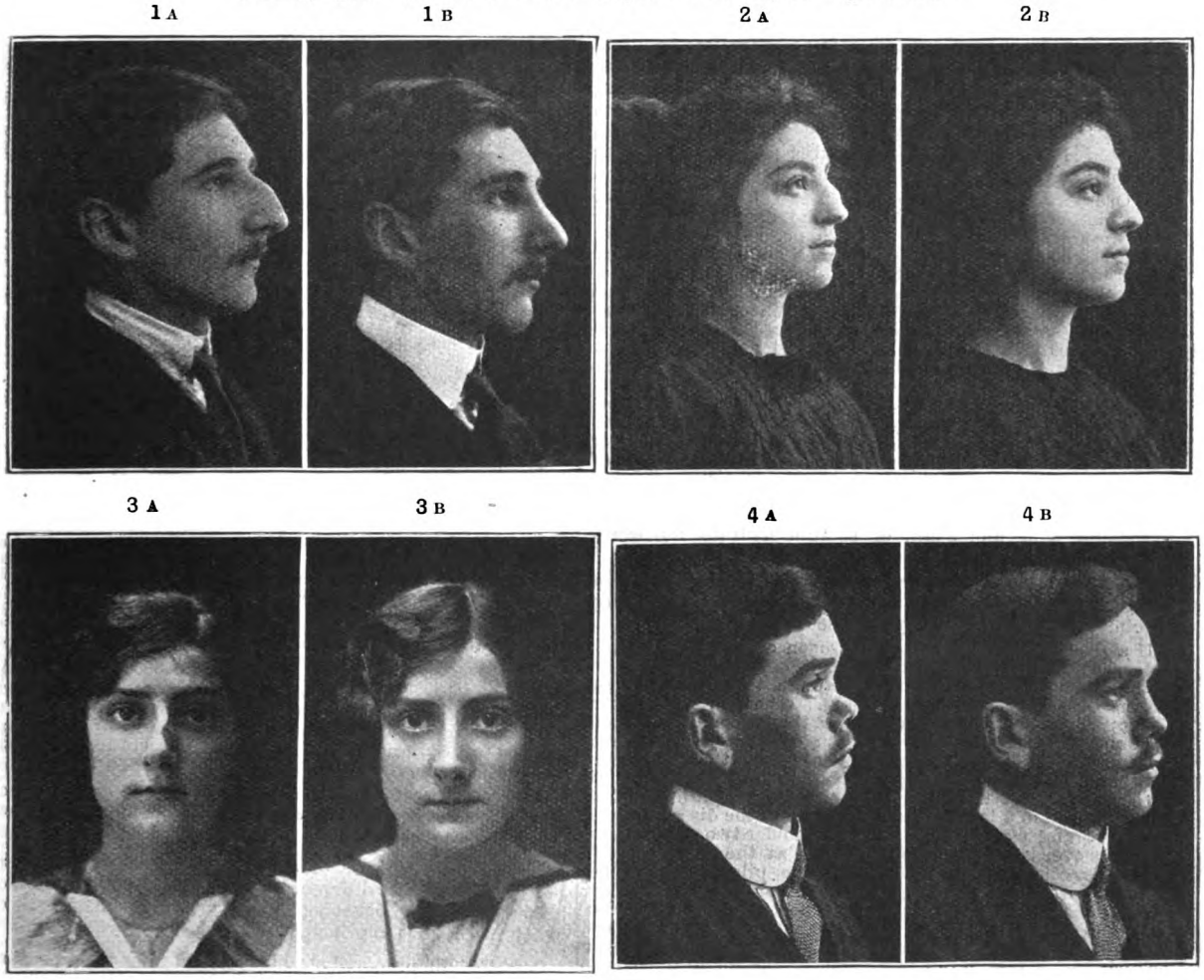
Rhinoplastic operations belong not only to the æsthetic but to the psychic sphere. The majority of those upon whom we operated did not desire a well-formed nose for elegance, or for purity of line, but rather a nose "like everyone else," one which "does not attract attention." As we expressed it in a communication to the Academy of Medicine in Paris on Feb. 23rd, 1917, the mentality of Cyrano was not created entirely by the imagination of a poet, but was the fruit of keen observation. It would carry us too far to quote the various complaints we have received from patients thus afflicted. Some speak of the prejudice occasioned by this unlovely feature, others of moral suffering or of the pleasantries of which they are the victims. "If there is anything to be done," wrote one of them to us after having described the shape of his nose, "I shall owe you a thousand thanks if you will let me know of it, for it is a source of suffering to me." It is necessary to have seen the emotional gesture with which the patient hurries to the glass at the termination of the operation, and his look of satisfaction on grasping the result, to be entitled to state that it is with them more than the satisfaction of vanity; it is actual moral salvation.

It is generally at puberty that the nose, which presented till then a normal aspect, changes in character, if it may be so expressed. The nose may develop largely in height, producing an exaggerated curvature (Fig. 1 A), or it may be only the medial portion that develops, thus resulting in the humpbacked nose. (Fig. 2 A.) In other cases the abnormal enlargement affects the length instead of the height, giving rise to various forms of pointed nose; in one type the nasal point is unable to bend over towards the chin, in another

bending abruptly towards it. In convex noses, with or without protuberance, and in unduly long noses, the two lateral portions of the nasal projection are symmetrical. In crooked noses these lateral parts are unsymmetrical, one developing more than the other; the result is a nose deviating from the middle line. Of the crooked nose thus formed, the fault may rest with the cartilaginous portion alone (Fig. 3A) or with both cartilage and bone. Noses may, of course, deviate from the straight line, not only as a result of asymmetrical development, but from traumatism.

Finally, in certain cases, an arrest of development may occur at the level of the bony framework, affecting the nasal bones as well as the ascending rami of the maxilla. These bony parts may fall in as a result of acquired syphilis. Traumatism may also result in a similar subsidence. Whatever the origin may be the result is a saddle-shaped nose (Fig. 4 A). Other less common nasal deformities occur, but the foregoing will serve as a general outline. All varieties of unlovely nose can be corrected by intranasal operation without, that is, incising the cutaneous covering.

Photographs of Cases taken Before and After Operation.



Operation.

This is always performed under local anæsthesia produced by an injection of cocaine-adrenalin. The mucosa is incised at the desired points; through the incision so made the skin is separated from the bony and cartilaginous framework, and the convexity or protuberance removed with a hand-saw. In certain cases an electric burr is employed. Finally, the skin is allowed to apply itself again to the underlying framework. (Figs. 1 B and 2 B.)

In pointed noses, when the tip does not descend properly towards the chin, the height of the nasal septum is diminished either with the bistoury or the scissors; and if occasion requires, so that the nostril may not remain too wide as a result of this operation, a portion of cartilage is removed from the ala. When, on the other hand, the tip of the nose is prolonged downwards the length of the septum is diminished by the removal of a triangular segment, and the point of the nose raised by means of sutures. When the point itself projects above the general nasal profile it is brought back into line by an operation on the alar cartilage. Deviating noses are also corrected by way of the endonasal passage. If the deviation concerns only the cartilaginous portion, one or several small prismatic segments of mucosa and of cartilage are removed from the convex side of the septum. The remaining portions are carefully sutured, thus rendering the septum perfectly straight. (Fig. 3 B.) If the whole nose deviates the frontal processes of the maxilla are separated obliquely on each side with a saw from the body of the bone and the nasal bones are disarticulated from the frontal. The nose is kept in proper position by a dressing until completely consolidated. Saddle noses are corrected by a bone graft obtained from the crest of the tibia, of size corresponding to the thickness and length required. (Fig. 4 B.) When the depression is slight it is readily remedied by an injection of solid paraffin, fusible at 60° C. In certain cases a small thing suffices to give to the physiognomy a more æsthetic appearance, such as the removal of a slight protuberance and raising the point of the nose.

Such are the outlines of the operative technique, and if a comparison is made of the photographs of patients before and after surgical intervention the results obtained may easily be estimated. In conclusion, I repeat that in the operation by the endonasal route there is never any visible cicatrix.

AN EASILY IMPROVISED AND EFFECTIVE METHOD OF OBTAINING PLATE CULTURES OF ANAEROBES.

BY W. JAMES WILSON, M.D. R.U.I., D.SC. BELF.,
CAPTAIN, R.A.M.C. (T.F.); SPECIALIST SANITARY OFFICER AND INSPECTOR OF TETANUS FOR THE BELFAST MILITARY DISTRICT.

ATTENTION being now directed to the study of anaerobic bacteria occurring in wounds, a means of easily obtaining pure cultures without the use of costly appliances seems worthy of report. The methods here described are, as far as I know, original in that no special plates are required. A brief review of previous efforts to simplify anaerobic plate cultures is given. The method can be improvised even under active service conditions and will be found convenient also in well-equipped laboratories. The distinctive features are the interposition of a perforated circular disc between plate culture and vessel containing alkaline pyrogallate solution. The discs I use are made of tinplate 1 mm. in thickness, but copper or glass would serve equally well. According to whether one or two plates or many are dealt with I use Method 1 or Method 2.

Method 1 is convenient for making a few plates. The following are required:—

1. Ordinary sterile Petri dishes. 2. A roll of plasticine or some melted paraffin wax. 3. A round disc slightly larger than the cover of the Petri dish. This can be easily improvised out of biscuit tins. To make a single plate culture anaerobically the surface of the medium is inoculated in the usual way. The medium I have used most frequently is blood-agar prepared by the method of Wilson and Darling[1] or recently boiled glucose agar.

The cover of the Petri dish is firmly fastened to the disc by means of plasticine or melted paraffin. Through the aperture of the disc 10 c.c. of a 10 per cent. solution of pyrogallic acid are introduced into the dish and then 5 c.c. of a 40 per cent. sodium hydrate solution or preferably about 2·5 gm. of the solid alkali. The inoculated plate is at once inverted over the disc and hermetically sealed to it by means of melted paraffin or plasticine. The amounts of pyrogallic acid and sodium hydrate used will, of course, depend on the volume of oxygen to be absorbed, the rule being to allow 1 gm. of pyrogallic acid and 2 gm. of sodium hydrate for every 100 c.c. of space.

Method 2.—If many plates are being inoculated it may be found more convenient to enclose them in a round, deep specimen jar and to invert it over the disc.

If a gas-supply or a Kipp's hydrogen apparatus is available the air in the jar can easily be expelled through an outlet tube by gas introduced through the plasticine by means of a glass or metal cannula. Where this procedure is adopted the last traces of oxygen in the jar can be absorbed by employing the cannula to push over the edge of the aperture a tablet of sodium hydrate into the pyrogallic solution contained in a large Petri dish under the disc. If no gas is available, then a larger volume of pyrogallic solution must be used in a larger vessel underneath the disc.

A neat and cheap appliance is to solder two metal discs together over two metal tubes opening at the central aperture. Over such a disc plates can be piled and then be covered with an inverted glass jar cemented to the disc by means of plasticine. A large Petri dish containing caustic soda solution is attached to the under surface of the disc by a ring of plasticine. When the apparatus is set up coal-gas or hydrogen is passed in through one of the metal tubes and carries the air out of the apparatus through the other open tube. After ten minutes a short length of rubber tube is connected to the exit pipe and a small funnel inserted into its distal end. Ten c.c. of a 10 per cent. pyrogallic acid solution are put in the funnel and the coal gas allowed to bubble through the fluid; the funnel is raised and the gas almost turned off so as to reduce the pressure inside the apparatus and allow of the passage of the pyrogallic solution through the metal pipe into the Petri dish at the bottom of the apparatus. Before all the solution has entered clips are applied to the rubber tubes and air excluded.

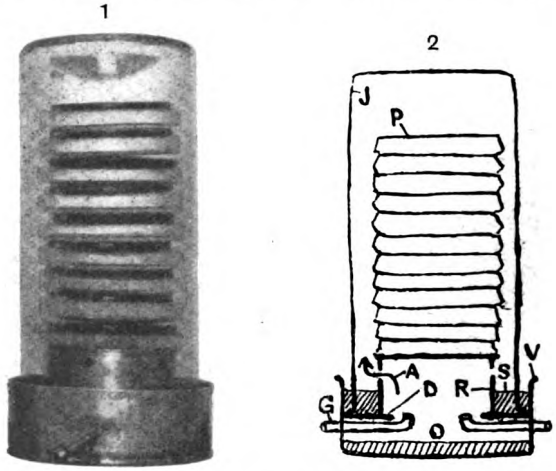
In order to avoid use of plasticine and to have an apparatus which can be used for anaerobic culture either of tubes or plates I have designed and had made to my directions the apparatus shown in Figs. 1 and 2. This apparatus has proved very useful and has given excellent results in practice. The principle of it can be readily seen.

As in other cases, a perforated metal disc separates the oxygen-absorbing fluid from the jar containing the plates or tubes. The disc (D) is soldered to the walls of the lower vessel which also contains in its sides the gas tubes (G). The specimen jar is inverted and its open rim is received into the trench containing liquid paraffin which acts as a seal (S). The walls of the trench are made up of (i.) side of vessel continued up one inch above level of disc, (ii.) of an inner ring of tin plate erected near circumference of aperture in disc. To allow passage of gas through whole apparatus the upper part of this ring is perforated, its edge serving to support the plates or tubes.

That the above appliances give good conditions of anaerobiosis I have proved by the following experiments:—

1. Complete failure of 12 strains of the *Meningococcus meningitidis* to grow whilst the same strains on the same medium grew well under aerobic conditions.

2. Excellent growth on plates of (*a*) *B. enteritidis sporogenes* isolated from fæces; (*b*) of 3 strains of *B. tetani* kindly supplied to the writer by Lieutenant W. J. Tulloch at the instance of Surgeon-General Sir David Bruce, C.B., F.R.S.; (*c*) of the following micro-organisms: (i.) strains from the Pasteur Institute—e.g., *B. sporogenes* Metchnikoff, *B. tetani*, *Vibrio septique*, (ii.) *B. histolyticus*, *B. fallax*, *B. œdem.*, and *B. aerofetidus* of Weinberg, (iii.) two strains of *B. perfringens*. These cultures were lent to the writer by Professor W. St. Clair Symmers, who had obtained them from Captain H. G. M. Henry, R.A.M.C.



1. Apparatus for anaerobic culture. 2. Explanatory diagram. A, arrow showing perforation through which the gas passes; D, perforated disc; G, gas tube (the corresponding tube on the right side of the diagram should turn downwards and not upwards as shown); J, inverted jar containing Petri plates; O, layer of oxygen-absorbing solution; P, pile of Petri plates; R, inner ring of tinplate erected on the disc; S, trench containing seal of liquid paraffin; V, tin vessel with soldered-in gas tubes.

3. Decolourisation of the marks of a blue grease pencil and of methylene blue solution either alone or when incorporated in agar.

Method 1 in the use of a perforated plate with ordinary Petri dishes is quite different in technique from any method hitherto described, but some account may be given of methods which resemble it in principle.

Lentz[2] (1910) prepared circular discs of filter paper, soaked them in pyrogallic acid and dried them. A Petri dish was inoculated and inverted over the filter paper, which rested on a flat glass plate and which before use had been moistened with caustic soda. The dish was fastened to the plate by means of plasticine.

McLeod[3] (1913) designed a special porcelain receptacle for the alkaline pyrogallate solution and over it inverted a Petri dish which was provided with a special edge to prevent condensation fluid coming into contact with the plasticine employed to connect the dish to the receptacle.

Kuester[4] (1913) employed special covers for Petri dishes. The cover over which the inoculated plate was inverted had a receptacle to hold the oxygen-absorbing fluid. As an absorbing fluid Kuester employed for every 150 c.c. of air space 2 gm. of acid sulphite of soda dissolved in 20 c.c. of distilled water together with 20 c.c. of a 10 per cent. solution of caustic soda.

Ogata and Takenouchi[5] employed three dishes, one being used to contain the pyrogallate solution. The inoculated plate was inverted over the pyrogallic solution and fluid paraffin or mercury was used as a seal.

Method 1 has the following advantages over those mentioned above: 1. No special glass or porcelain dishes are required. 2. Moisture from the pyrogallate solution condenses on the surface of the metal disc and the surface of the medium is in this way protected from it. Condensation of moisture on the surface of the medium is a serious objection to several of the above methods. 3. The ease with which it can be improvised. Method 3 will be found to give as good results as the well-known apparatus of Botkin, Bulloch, and Novy, and I think will be found much more convenient and cheaper.

References.—1. Wilson and Darling: Brit. Med. Jour., 1916, ii., 900. 2. Lentz: Centrabl. f. Bakt. Orig., 1910, liii., 358. 3. McLeod, S. W.: Jour. Path. and Bact., 1913, xvii., 454. 4. Kuester, 1913: Centrabl. f. Bakt. Ref., lvii., 269. 5. Ogata and Takenouchi, 1914: Centrabl. f. Bakt. Orig., lxxiii., 75.

A NOTE ON

A NEW BONE CLIP FOR THE TREATMENT OF FRACTURES OF LONG BONES.

BY JOSEPH E. ADAMS, M.S. LOND., F.R.C.S. ENG.,

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THE operative treatment of fractures has for some time occupied a prominent place in modern surgery, and any method which simplifies or shortens these tedious operations will no doubt be readily welcomed. About a year ago I made use of two clips of tempered spring steel, similar to those illustrated, for the treatment of an oblique fracture of the femur in a small boy, aged 7 years, in whom good position could not be obtained by non-operative measures. The result was very satisfactory, and firm union was obtained in six weeks with a quarter of an inch of shortening. His leg to-day is perfect in function and a skiagram shows satisfactory progress in bone growth despite the partial circular constriction to which the bone has been subjected for nearly 12 months. For various reasons I have not had very many suitable cases under my care requiring operation since this date, but recently I have improved the clip by the addition of a series of teeth turned over from its edge, and these will hold it firmly in place and prevent rotation of the fragments. I find that rarely, at any rate in children, will it be necessary to use more than one clip for an oblique fracture. So well does the new clip work that I have recently applied one for treatment of an oblique fracture of the femur, and now have considerable difficulty in finding the line of fracture in the post-operative skiagram.

In transverse fractures the case is rather different. I have therefore added a flange, so that the fracture line may be splinted by the flange attached to one clip and secured to the other fragment by a clip embracing both flange and bone. (Figs. A and B.)

Circular constriction of bones in the treatment of fractures is open to the theoretical objection that the vascularity of the bone may suffer and lead to arrest of growth or even atrophy, but for some time past Parham and Martin[1] have employed a band of metal which completely encircles the shaft in the case of oblique fractures, and they report no ill-effects. With regard to my clips I may say that I have used them for fractures of the tibia as well as the femur, and they are designed to encircle the bone for not more than two-thirds of its circumference; the addition of the spikes prevents pressure over a large area of bone. In any case there is no process of rarefaction initiated affecting the medulla, similar to that which may follow the fixation of screws through the cortex of the bone, as in the application of Lane's plates.

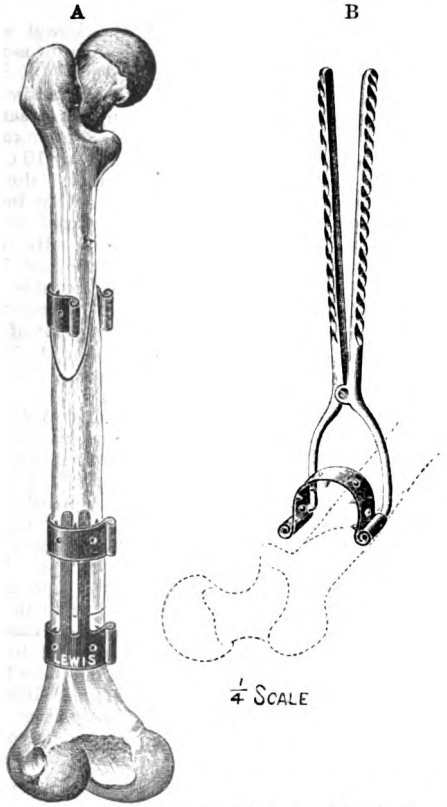
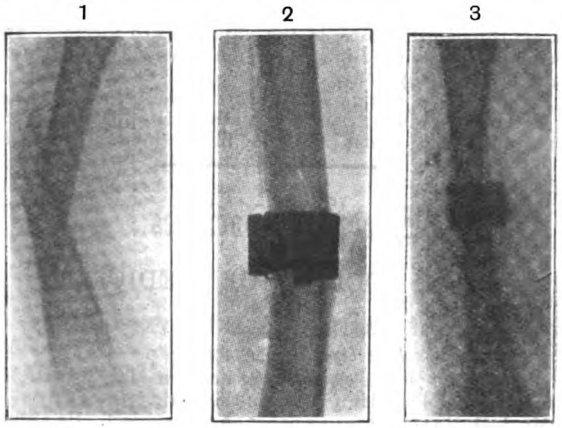


Fig. A shows a transverse and an oblique fracture of the femur, produced by saw-cuts, held in position by clips, drawn from an actual specimen. The upper oblique fracture was easily secured by one clip. The lower transverse fracture is held in good position by one flanged clip and another embracing both flange and proximal fragment.

Fig. B shows the introducer, the prongs of which pass through small loops at the ends of the clip. When this is withdrawn the clip will close tightly on to the bone. This instrument is made with a screw joint so that it can be taken apart.



Skiagram of an oblique fracture of the left femur in a boy of 8 years treated by means of the bone clip. 1. Before operation, Dec. 7th, 1916. 2. After operation, Jan. 4th, 1917. Lateral view. 3. The same. Antero-posterior view.

With regard to the instruments illustrated it will be seen that I show only bone clips and an introducer. As a matter of fact, the only other special instruments required are a pair of curved bone retractors as designed by Sir Arbuthnot Lane. These instruments are of the greatest use in holding the fragments of the bone clear of muscle whilst traction is applied and they are manipulated into position. It will be seen at a glance that the introducer is designed so that the principles of aseptic surgery can easily be complied with, and there is no necessity to touch the clip with anything but the prongs of the introducer, which fit into the loops of the clip. This can then be passed round the bone fully open until the best position as regards fixation of the fragments is found, and then, and not until then, the prongs should be disengaged. This warning is important, as it is difficult to remove the clip when once it is placed in position without disturbing the set of the fracture.

The subjoined skiagrams are of the second case which I have treated in this manner. The patient, a boy, aged 8 years, is now (Feb. 5th, 1917) up and walking about the ward without crutches, with no shortening, and with a

[1] Surgery, Gynecology, and Obstetrics, November, 1916.

perfectly sound leg. It has been apparently firmly united ever since the third week after operation.

It may be that we have yet to learn what is meant by "primary union" of a fractured bone, and this case appears to exemplify it.

I am publishing this preliminary note as I trust that other surgeons may be attracted by the method sufficiently to give it a trial. Personally, I shall be glad to be rid of the huge armamentarium of Lane's plating apparatus, at any rate for the shafts of long bones, and to be spared the tedious task of applying such plates and screws. With my clip the fixation of the fragments is the work of a few seconds when once perfect apposition has been attained.

The clips and introducer have been made for me by Messrs. Lewis and Co., of Westmoreland-street, W., and I am now having suitable ones made for use on bones other than the femur, which probably does call for operative fixation more frequently than any other bone. It is possible that this method of fixation of fragments may be permissible in the treatment of compound fractures, since it involves no interference with the medulla of the bone. Moreover, union of the bone in an oblique fracture is favoured by pressing the raw surfaces together. If removal of the clip be required at a later date the two halves of the introducer can be separately passed through the loops of the clip, screwed together, and used to withdraw the clip much in the same way as midwifery forceps are employed.

For the accompanying skiagrams of a case before and after operation I am indebted to the Children's Hospital, Shadwell where the operation was performed in December of last year.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

Post-Operative Tympanites.

A MEETING of this section was held on May 3rd, Dr. G. BLACKER, the President, being in the chair.

Mr. J. D. MALCOLM read a paper on this subject. He argued that the nervous system of the intestine was temporarily put out of gear by the stimulations associated with exposure and manipulation of the peritoneum during abdominal operations, results being a delayed activity of the propelling function of the alimentary canal and as a consequence some degree of discomfort, nausea, and distension of the abdomen, the action of a purgative being frequently necessary to restart normal peristaltic activity. Occasionally it was impossible to get the bowels to move by any means, and then if there was no other complication a tympanites developed and continued until death took place. In some such cases life could be saved by making an intestinal fistula. This treatment if it effected a cure was followed by a subsidence of the distension and by a movement of the bowels a few days later in response to enemata or to purgatives. The fistula was closed after a time without any subsequent bowel difficulty. Under such circumstances there was clearly no paralysis and no obstruction of any part of the intestine, only a short rest of the lower bowel was necessary to effect a cure. When such cases died unrelieved signs of septic peritonitis were always found at an autopsy if the patient died slowly, because micro-organisms passed from the bowel to the peritoneum when the patient was *in extremis*. But in many such cases there was no spreading peritonitis when a second operation was performed, and therefore the peritonitis followed and could not be the cause of the tympanites. Intestinal adhesions might aggravate the difficulties of the propelling force even if a complete mechanical obstruction was not produced. Opiates also induced symptoms of obstruction. The chief object of the paper, the speaker said, was to differentiate those cases in which trouble began with an inefficient peristalsis from others in which a septic-spreading peritonitis was the first pathogenic condition and was followed by paralysis of the bowel and tympanites. Unless these two classes of cases were recognised many of the conditions following operations upon the abdomen could not be understood, and confusion must arise between the peritonitis which was a cause of tympanites and the peritonitis which was a consequence of tympanites.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

Hæmatemesis and Melæna Neonatorum.—Vaginal Plug.

A MEETING of this section was held on April 20th, Dr. GIBBON FITZGIBBON, the President, being in the chair.

Dr. BETHEL SOLOMONS read some notes on a case of Hæmatemesis and Melæna Neonatorum. The bleeding started on the day after the delivery, which was uneventful, and large amounts of red blood were passed by the mouth and rectum. The detailed history of the case was given, and the following points were noted:—

1. That the child was a female; the condition being supposedly more common in males. 2. The fact that ice-cold water, which is recommended in these cases, causes great pain; while, when the chill is removed, hæmorrhage does not recommence, and there is no more pain. 3. That starvation can be sustained for so many days (six in this case). 4. That the cure in this case was effected by good nursing, warmth, quiet, water, a mixture of adrenalin chloride and calcium lactate, and the injection of horse serum; that the baby disimproved when the serum was temporarily stopped, and improved when administered again; that large doses of serum give better results than small, and that when given hypodermically or by the mouth the result seems to be the same; that while no anaphylaxis was noticeable in this case, the physician should always be ready for this phenomenon, for which the best treatment is pituitary extract in small doses. 5. That it was possible that the ulceration in the gastro-intestinal tract was caused by some toxin carried from the mother to the child while still in utero.

Dr. E. HASTINGS TWEEDY said that these cases were nearly always due to duodenal ulcer, and horse serum in massive doses appeared to act as a specific. The dose should not be smaller than 10 c.c. It was seldom necessary to repeat the dose. Once the bleeding ceased the infant's condition rapidly improved, and perforation of the bowel appeared never to occur. Starvation was unnecessary for more than two days; breast-milk might then be given.—Dr. SPENCER SHEILL said that he had published notes of a similar case two years ago, the treatment of which by horse serum was the first recorded success. He believed a more rapid and successful result would have been obtained by 10 c.c. doses of serum, instead of the smaller and repeated doses.—Dr. W. M. CROFTON thought the serum must act by inducing a larger production of thrombin, since, if mixed with fresh blood outside the body, it delayed clotting. He described two cases of anaphylaxis occurring after the first injection of serum intravenously, and discussed the probable cause of the change in the serum producing this. These cases had led him to introduce pituitrin for the treatment of anaphylaxis. He criticised the exhibition of lime salts by the mouth, suggesting that they could have been better given in the form of the mother's milk.

Dr. HASTINGS TWEEDY read a paper on the Ability of the Vaginal Plug to Cause a Direct Pressure on the Uterine Vessels and on the Side Walls of the Pregnant Uterus. He said that the plug had a different significance in Dublin from that which it enjoyed elsewhere. It was impossible to cause compression of the uterine vessels if rolls of cotton-wool (each tied round with a string) were passed into the vagina with the aid of a speculum and plugging forceps. If, on the contrary, the left hand was entirely inserted into the vagina and small pledgets of moist cotton-wool were inserted by means of the other hand, it was comparatively easy to press from 30 to 40 separate pieces into the canal and to force up the lateral fornices until a hard tumour could be felt rising high above Poupart's ligament. In the year 1898 he had brought forward evidence that a plug so inserted was able to stop the circulation of the uterine vessels. Recently, in a series of Cæsarean sections, he had been able to demonstrate in a convincing manner that the plug acted in the way explained in his former paper.

MEDICAL STUDENTS IN SWITZERLAND.—The total number of students studying medicine at the Swiss universities during the winter 1916-17 was 1801, of whom 291 were women. Out of this number 726 were foreigners, and of these 185 were women. The students were distributed as follows: Basle, 215; Berne, 411; Geneva, 512; Lausanne, 248; Zurich, 515.

THE LANCET.

LONDON: SATURDAY, MAY 12, 1917.

Science and the Nation.

"WHAT people call Applied Science is nothing but the application of Pure Science to particular classes of problems," said Professor HUXLEY, and thus corrected a popular misunderstanding of the times which still flourishes, if not so freely now as then. For certainly the mass of the public believe that the man engaged in research—the chemist or physicist in the highly organised laboratory attacking specialised problems—is not bringing the mystical qualifications, with which they willingly credit him, to bear upon the practical issues of life. This frame of mind arises from two main causes. The first is the ignorance of the public of the grammar of science, an ignorance displayed even by the men whose daily routine brings them into immediate contact with the results of scientific research. It does not enter into the mental equipment of the average citizen to understand, even in a general way, the terms of science or the obvious phenomena of chemistry or physics. In the factory, the brewery, the railway shed, he knows accurately many things, but his knowledge is utilised for the most part empirically and specially—he has little idea of the general significance of what he is engaged upon. He has never had education along the necessary lines. The second main cause is no less obvious why the public do not perceive that the applied knowledge, which activates the best part of the world's activity, is just the knowledge which at first emanated from research. It is this. The worker in "pure" science does not and cannot announce beforehand that he is going to solve a certain problem, or to make a discovery which will have a certain outcome in "applied" science; hence, when the public come into possession of the results of research, no history reaches them connecting the practical benefits, which the public *can* appreciate, with anything which anyone has previously done in a laboratory. In this way the debt owed to research goes unrecognised, and the oversight may have a specially dangerous sequel to-day. For all can see that after the world-war many industries will have to be rebuilt which rely wholly upon applied science; and there will be an enormous impetus given to the output of all sorts of commodities, the manufacture of which depends upon the use of high technical knowledge. Attempts to go forward on the commercial side without reference to the proper source of energy—namely, research—will be slow, ill-directed, and unsuccessful.

Recognition of this position has inspired a group of Cambridge graduates, holding high positions in their branches of pure science, to write a series of essays demonstrating how research carried on in their various departments has led in the past, and is leading now, to the conduct of the business of life in its most useful, nay, most indispensable, forms. No one needs to be convinced on this point as far as mathematics and physics are concerned, but in other directions the evidence does not lie so clearly in sight, and its production in these essays may be very valuable. Mr. WALTER ROSENHAIN, superintendent of the Metallurgy Department of the National Physical Laboratory, for instance, proves that our immense strides in metallurgy, enabling metal strains to be definitely calculated and "fatigue" avoided, and alloy steels and aluminiums to be manufactured of infinite hardness, started with the invention, in the course of research work by LE CHATELIER, of the thermo-couple for the registration of enormous temperatures, and with the discovery by HENRY CLIFTON SORBY of the crystalline structure of metals; and it is piquant here to recall that the importance of SORBY'S work was quite unrecognised at the time when it was done, while he himself could not have been aware of its great significance. Mr. F. W. KEEBLE, director of the Royal Horticultural Society's Gardens at Wisley, Mr. W. DAWSON, reader in forestry at Cambridge, Mr. R. H. BIFFEN, professor of agricultural botany, and Mr. T. B. WOOD, Draper's professor of agriculture in the same University, show respectively how the methods of intensive cultivation have been discovered by research; how the output of timber, for some time so perilously short in this country, can be largely increased by attention to scientific procedures, planned and tested in the laboratory; how systematised breeding may improve the yielding capacity of wheat, and place the nutrition of farm animals upon a rational basis. More than one of these writers point to the botanical experiments of GREGOR MENDEL in the garden of an abbey as the inspiration of scientific labours that are already bearing famous fruit; for MENDEL, like SORBY, was building better than he knew, and illustrating the impossibility of prophesying what will be the scope or influence of any scientific discovery at the moment that it is made. The examples of the association between research and manufacture given by Professor W. J. POPE, professor of chemistry at Cambridge, in the opening essay of the series, are drawn from the conditions of war, and he points, as we have done already in these columns, to the curious fact that certain great chemical industries, like dyeing and the preparation of synthetic drugs, sources of enormous wealth in times of peace, can be transformed in times of war into manufactories for high explosives. The moral to be drawn here lies on the surface for this country. If we had been able as a nation to receive with intelligence the information from the laboratories of our scientific chemists, we should not have allowed these great industries to be wrested from us by the Germans, who grew fat on them in times of peace, and have employed them against us, to our unspeakable hurt, throughout the war. The nation was deaf to the message of its chemists.

Lord MOULTON, one of our most learned citizens, in an introduction to the essays which highly

commends their study (as we are now doing), believes that the vague and artificial distinction between pure and applied science does not exist as an influential principle in this country. This is excellent hearing for the votaries of medicine, who can show good cause why there should be full appreciation of medical progress. Indeed, medical research, since discovery extended the scope of medicine from that of an art to that of a science, has bestowed through its practical application benefits upon mankind that can no longer escape popular recognition. The essays dealing with the subject are written by Professor GOWLAND HOPKINS, Professor G. H. F. NUTTALL, and Dr. G. S. GRAHAM SMITH, respectively occupying chairs in biochemistry, biology, and hygiene at Cambridge, and they form an admirable exposition of the way in which the highest forms of academic work have rapidly found public applications resulting in the saving already of untold lives. We need not traverse with medical readers the well-known country where the landmarks are the discoveries of PASTEUR, LISTER, KOCH, LAVERAN, MANSON, ROSS, METCHNIKOFF, BEHRING, EHRLICH, GORGAS, WRIGHT, BRUCE, and others, or narrate the wonderful ingenuity and bravery by which the Panama Canal zone was freed from yellow fever; but we congratulate the authors of the papers dealing with medical research upon drawing a map of that country which for all who are commonly intelligent furnishes lucid information upon technical matters of extreme complexity. The last essay, by Captain W. H. R. RIVERS, on the value of anthropological knowledge to an empire which has the charge of many subject races, differs from the other contributions in omitting marked examples of success following the application of scientific teachings; but the writer has no difficulty in convincing us that official blindness to the lessons of ethnology has not seldom had tragic consequences for ourselves and our dependents.

We desire for this excellent little volume[1] the widest possible circulation; it is a winning brief for those who have been advocating for years the endowment of pure research in this country. A start has been made, as far as medicine is concerned, with the Medical Research Bureau, but the satisfactory beginning must have far larger developments.

The Rationing of the People.

THE Royal proclamation issued last week as to the necessity of husbanding our food supplies no doubt brought home to a good many still sceptical and heedless people the seriousness of the situation, and now we have Lord DEVONPORT'S statement in the House of Lords last Tuesday that preliminary steps are being taken to put into force a scheme of rationing the nation. It will necessarily be a vast piece of administrative machinery which will require the utmost care and consideration in regard to detail and its subsequent application to the common affairs of our daily life. We must profit all we can by the experience of the past, and especially from the mistakes of those nations which have attempted a practical and systematic solution of the problem. There are already many lessons before us which should not require to be learned again. In any case we shall be called upon to exercise patience and forbearance, and in this we may be helped by the hope that it will not be long before the situation is relieved in obvious ways. Our physiological authorities have done well to urge not only what are the daily requirements of the individual in regard to the kind and amount of food necessary for maintenance, but also to point out the great importance of basing allowances upon the demands placed upon the energies of that individual. Dr. M. S. PEMBREY, in a paper published in our present issue, refers to this aspect of the question and rightly says that a system of rations which pays no attention to occupation is absurd, for clearly the man who does essential muscular work must have a greater amount of food than the sedentary worker. Otherwise our national efficiency may well be impaired. The particular food needs of the children in the family will call also for special attention; and, indeed, the whole system of rationing, while in any case it must mean exercising considerable economies, must have a logical or physiological basis or the results may be disastrous. The handing out of rations, in other words, must be scientifically fair so far as the situation permits. Lord DEVONPORT said that it was his endeavour to take no measures which would benefit the rich at the expense of the poor. Such preference will be immensely hard to avoid, and can only be avoided by limiting each consumer to the number of calories required to maintain his body heat and perform the work required of him. Any consumption of food in excess of this limit, irrespective of purchasing power, must be made impossible for rich and poor alike, if Lord DEVONPORT'S action is to have effect. This can be secured by getting a return of the routine of the daily life and domestic situation of the individual. All these questions, we are sure, are being carefully considered by the Food Controller, who has, no doubt, received the counsels of the strong advisory body of scientific men placed at his disposal. They are not likely to miss any single point vital to the issue, but if this should happen the error will be immediately detected, when readiness to modify any instructions will be displayed by those in authority, who have always shown themselves ready to take advantage of popular experience.

[1] Science and the Nation: Essays by Cambridge Graduates. With an Introduction by the Right Hon. Lord Moulton, K.C.B., F.R.S. Edited by A. C. Seward, Master of Downing College, Cambridge. Cambridge University Press. 1917. Pp. 328. 5s. net.

DONATIONS AND BEQUESTS.—The late Mr. Joseph Taylor, of The Bungalow, Great Barr, Staffordshire, has left by will £20,000 to the Walsall and District Hospital, £10,000 to the Walsall Victoria Nursing Institution, £5000 to Queen's Hospital, Birmingham, and £2000 each to the Birmingham and Midland Eye Hospital, the Society for the Prevention of Cruelty to Animals, the Wolverhampton and Midland Counties Eye Infirmary, and the Midland Counties Home for Incurables, Leamington.—By will the late Mr. James Forrest, of St. Leonards-on-Sea, has left £5000 in trust, which will ultimately be divided between St. George's, the Middlesex, and the Westminster hospitals and the Victoria Hospital for Children.—The late Mrs. Anne Chambers, of Prince's-gate, W., has left £1000 to the Staffordshire General Infirmary.

Annotations.

"Ne quid nimis."

LESSONS OF THE WAR IN THE MATTER OF WATER-SUPPLY.

RIVERS as sources of water-supply—at least in the cases of the Thames and Lee—were very nearly ruled out some years ago when it was seriously proposed to draw on the watersheds of Wales for the supply of water to the metropolis, following the schemes adopted by Liverpool and Birmingham. Manchester draws its supply from Thirlmere Lake in Cumberland and Glasgow from Loch Katrine. An important difference between lake and mountain supplies and the generality of river supplies is that the former are invariably free from lime salts, while the latter are hard. This last quality is a source of considerable trouble and expense to water consumers in London, and notably to those in the Kent districts where no attempt is made to soften the water derived directly from the chalk wells. Of course, it is of prime importance that attention should be given to organic rather than to inorganic quality, and this is what has been admirably done in the case of the river-drawn supplies to the metropolis. We may, perhaps, hope that now it appears to be well established that raw river-water can be purified to any required standard of safety the future may see a softened supply also. It is doubtful whether a hard water-supply has any prejudicial effect upon the public health, but in many directions the advantages of a soft water-supply are obvious and would result in considerable domestic and technological economies. Dr. A. C. Houston, the director of water examinations, Metropolitan Water Board, whose arduous labours on the subject have brought the metropolitan water-supply to its present constancy and purity, has shown[1] that there are several reasons leading to the belief that rivers are likely to be used to an increasing extent as sources of water-supply. First of all, our sources of supply are limited, and many of the available watersheds are already appropriated. Then the danger of using river water for potable purposes has in the past been exaggerated; although it should be remembered that Dr. Houston is speaking in the light of present important methods of purification largely the outcome of his own investigations. Finally, he says, there are cases where there is an economic gain in the choice or in the retention of a river water-supply, adding "for many years to come, any *legitimate* means of saving money ought to be regarded as a national duty." It was the need for economy which led also to the use of a chlorination method of sterilisation which saved a considerable amount of money and time expended in storage in the great reservoirs. Whether such a course would have been adopted by this time had not these great national economical considerations arisen is a matter of opinion. The end, however, has justified the means. Dr. Houston frankly says he is not pledged to support sterilisation or any other special method of water purification. At the same time he feels that the war has taught us many lessons, including the necessity of subordinating sentiment to expediency. Pure water is a prime necessity of life, and, ideally, to obtain it we should draw on a pure source of supply. But we have to deal with the situation as we find it, and we are faced with an impure supply. The only recourse then is to put into execution methods which without doubt render the raw material wholesome. This Dr. Houston has done, and he is confident of continuing able to do so. It is a responsibility that has been finely undertaken.

[1] Rivers as Sources of Water Supply. By Alex. Crulkshank Houston, M.B., D.Sc., F.R.S. Ed. London: John Bale, Sons, and Danielsson.

THE IMMEDIATE MOVEMENT OF INJURED JOINTS.

AT a meeting of the Académie de Médecine of Paris M. Ch. Willelms, director of the Belgian Military Hospital of Hoogstaede, described his treatment of wounds of joints by immediate mobilisation. In 1909 he first advocated the treatment of hæmarthrosis of the knee by puncture followed by immediate walking. Though opposed to current teaching this treatment obtained supporters at once. Those who had the courage to try it found it superior to other methods by reason of its simplicity, complete innocuity, and rapidity of cure. Extending this treatment, M. Willelms applied it to grave injuries of joints other than hæmarthrosis. From industrial accidents he extended the treatment to military surgery. He is now convinced that the current method of treatment by immobilisation is defective and should be abandoned. It leads to stiffness of joints and atrophy of muscles which never occur under the new method. The former can be avoided by passive movements, but muscular wasting can be completely prevented only by active movements. To prevent atrophy of the quadriceps it is not sufficient that the patient performs movements of flexion and extension of the knee while lying in bed. He must walk. Numerous objections may be made. It may be asked, Is not mobilisation painful? The performance of the function of a wounded joint is not painful, even when there are osseous lesions, provided no displacement is produced. Will not an articular wound render a joint incapable of performing its function? Incapacity occurs only at the beginning when the joint is distended by effusion, and later when muscular atrophy has developed. Will not the lesions be aggravated by the movements? On the contrary, the cicatrisation of articular and periarticular lesions is accelerated by active movements. So far from causing irritation, they favour absorption of effusion and infiltration, thanks to a kind of internal massage so produced. Can the movements aggravate infection? If the joint is closed or insufficiently opened movements may contribute to the diffusion of germs and the extension of arthritis. But if there is a good opening each movement has the effect of expelling pus, and the joint is better emptied than by drainage. Further, movements are the best method of promoting absorption of the periarticular exudation which always accompanies arthritis. In cases of wound of the knee produced by a rifle bullet without fracture there is often only a simple perforation. All that M. Willelms finds necessary is to cleanse and dress the wound. He then allows the patient to walk immediately. But for wounds due to shrapnel, shell, bomb, or grenade he performs free arthrotomy, excises the track, removes the projectile, and sutures the wound. A simple dressing is applied, and the patient is directed to perform movements as frequently and as extensively as possible, even to the

point of fatigue. He begins to walk after a few days, sometimes almost immediately. The same treatment is followed when the articular wound is accompanied by osseous lesions without tendency to displacement. If the damage of the bone is important immediate walking is out of the question, and movements of flexion and extension are ordered, their extent depending on the amount of sound cartilage left. If the greater part of an articular cartilage is destroyed there is no longer anything to call a joint, and mobilisation is without object. If there are extensive bony lesions the possibility of immediate mobilisation depends on the absence of any tendency to displacement of the fragments. If this is to be feared mobilisation must be abandoned. If the arthrotomy has not ensured complete disinfection of the joint arthritis will appear—not in consequence of the movements, but in spite of them. The joint must then be reopened more extensively than before, and while allowed to remain open the movements must be continued. The pus or other fluid will be expelled on each movement and ideal drainage realised.

ALOPECIA AREATA AND PARATHYROID DEFICIENCY.

Alopecia areata, or area celsi as it is often called, is a not uncommon form of baldness. It is rapidly produced and patchy in its distribution; the patches often spread and may coalesce to such an extent as to render the patient completely hairless, though such extreme instances are rare. The common form of alopecia areata is that in which patches or bands of baldness occur on the scalp, characterised by the presence at the edges of hair-stumps shaped like marks of exclamation. The pathogenesis of the disease is obscure. In a few cases the distribution of the bald patch over the area of a cutaneous nerve, and its association with a local neuralgia, has suggested a local neuritis. To explain the ordinary cases three main hypotheses have been invoked. According to one view, the disease is microbic in origin, contagion occurring, although rarely, but no causative microbe has yet been found. According to a second view, it is trophoneurotic in origin, but against this hypothesis it may be urged that the disease is common in childhood and that the bald patches but rarely correspond with the distribution of any nerve. According to a third hypothesis alopecia areata is toxic in origin, the toxin, which is unknown, being either produced locally or carried to the affected area by the blood-stream. A fourth hypothesis of the pathogenesis of the disease has recently been advanced by Dr. G. C. Bolten.[1] He holds that it is a manifestation of latent tetany, and that it is due to deficiency of the secretion of the parathyroid glands. He bases this endocrine hypothesis, as it may be called, on two cases of the disease he has recently treated. One patient was a boy aged 9, the other a greengrocer of 48; both presented a single recognised sign of latent tetany—namely, the presence of Erb's sign—and the older patient in addition had brittle finger-nails and thick skin on the fingers, signs held by Dr. Bolten to be suggestive of latent tetany. Erb's sign consists in an increase of the excitability of the motor nerves to galvanic currents; the other well-known signs of tetany, known by the names of Trousseau and Chvostek, were not present in Dr. Bolten's patients and the Wassermann reaction was absent in both. The elder patient was neurotic, but otherwise in good health, and the boy appeared to be perfectly normal apart from his alopecia. Dr. Bolten does not specify the treatment he gave these two patients and, more particularly, makes no mention of medication with parathyroid gland substance or extract.

[1] Nederl. Tijdschr. v. Geneeskunde, Amsterdam, 1917, i., 24.

THE SANITATION OF PUBLIC BUILDINGS IN THE UNITED STATES.

THE benefits that accrue to the United States from having an organised body of medical health officers united into a Public Health Service manifest themselves in divers ways. For the service has its own inspectors, bacteriologists, laboratories, and chemists, and appears to be hampered by no limitations of scope. It was this service which organised the campaign against ground squirrels in California when there was fear of plague, and which extinguished the now forgotten charlatan Friedmann, who tried to exploit a turtle-grown tuberculin. The latest field of action reported is the sanitary inspection of public buildings in Washington, D.C., the results of which are set out by Dr. J. R. Hurley, of the United States Public Health Service, in a recent issue of the *Military Surgeon*. We learn that in 1912 the officers of the Public Health Service were ordered regularly to inspect all Government buildings in Washington except those of the Navy and Army. Some of these are museums and historic buildings visited by large numbers of people, some are mere offices; they are very various and their management differs accordingly. From the accounts given it is obvious that practices vary, but principles emerge, and to these we direct attention. Thus the best ventilation is held to be by the double supply and exhaust system. Usually the office windows are opened for five minutes in the middle of the morning and afternoon, the staff during these periods "stirring around." Desk fans are advocated and steam heating, the resulting dryness of the air preventing inconvenience from the high temperature reached, which is no less than 78° F. To us it appears no wonder that ice-water is freely supplied. The optimum is considered to be reached at lower temperatures with 76 per cent. relative humidity. Indirect electric lighting is preferred because of freedom from glare and distinct shadows. A cream-coloured ceiling and light shades of buff or green flat-surfaced paint that can be washed are recommended for walls. The Public Health Service makes itself responsible in a detailed way for the lavatory and similar accommodation of employees, and in the Government Buildings at Washington these things appear from the report to be carefully watched. Every Government employee is provided with a clean individual towel once a week, while hot water, liquid soap, and paper towels are in use in the lavatories. Rest rooms for women are fitted up in practically all the buildings where women are employed, sometimes with a matron in charge, and sanitary towels are supplied by automatic machines or otherwise. Stress is laid by the Public Health Service on orderliness of offices. The disorderly office, says the report, cannot be cleaned—papers on the floor cannot be disturbed by the cleaners for fear of loss. Books and papers for record are therefore to be sent to filing rooms promptly, and all coats and hats to dressing-rooms. All unnecessary

pictures are prohibited and the office furniture must be made to stand on feet to permit cleaning underneath. This careful inspection of Government offices at Washington raises the standard of welfare of Government employees, and should improve the whole standard of working office conditions throughout the United States. Official life in England is now very crowded, and we recommend the idea of the general inspection of public offices to the Local Government Board.

A DISCUSSION ON TOXIC JAUNDICE.

A FULL report of the discussion on toxic jaundice in munition workers arising from trinitro-toluene and tetrachlorethane, which took place at the Royal Society of Medicine on Jan. 23rd last, has been issued as a separate volume of the Proceedings at 7*s.* 6*d.* Dr. T. M. Legge, H.M. Medical Inspector of Factories, indicates in his introductory remarks the extent of the problem which industrial toxic jaundice now presents, and its study will be found to throw a flood of light on much that has hitherto been obscure in disease of the liver and blood. The etiology, symptoms, pathology, and preventive measures are dealt with by those who have had the widest experience of this new industrial disease. Dr. H. M. Turnbull, pathologist to the London Hospital, states it as his opinion that the study of the lesions caused by trinitro-toluene in the liver should be of great assistance in the elucidation of the causes of examples of similar atrophy of unknown etiology found from time to time in the post-mortem room, and a similar study of the effect upon the blood and the blood-forming organs should go far to clear up the cause of various forms of so-called idiopathic anæmia. The liver changes are beautifully illustrated by three coloured plates and several microphotographs of specimens prepared by Captain Matthew J. Stewart, R.A.M.C., pathologist to the Royal Infirmary, Leeds. Both he and Dr. P. N. Panton lay stress upon the polymorphonuclear leucopenia, often of extreme degree, found in several cases. Dr. Benjamin Moore, F.R.S., emphasises the probability of absorption directly through the skin playing a leading part in causation, and the importance of clean working as a corollary. A useful summary of the discussion by Surgeon-General H. D. Rolleston concludes the issue.

HEART FAILURE DURING AN OPERATION: HEART MASSAGE AND RECOVERY.

A REMARKABLE example of saving a patient's life after the circulation had failed, during an operation for the removal of tonsils and adenoids, by heart massage, is recorded by Mr. W. M. Mollison in the *British Journal of Children's Diseases* for March. It is remarkable for three reasons. One is on account of the length of time, estimated at 13 minutes, during which the heart stopped beating. In the published records of 13 successful cases of heart massage for a similar purpose which the author has been able to collect, this time-period was usually only two or three minutes, the longest being eight minutes, and, as he suggests, it is open to question whether the heart would not have recovered without the massage in such instances. The second unusual circumstance was that the region in which the operation was performed did not of itself facilitate massage; so that a separate and rapid incision into the abdomen was required in order that the hand, thrust up over the liver, could be applied to the heart, the diaphragm alone intervening. And lastly, interest attaches to the curious cerebral state which continued for some days after the operation. The patient was a boy aged 6 years. He was slight, but healthy in appearance. The anæsthetic, given on an open mask, was a mixture of chloroform, two parts, and ether, three parts. The left tonsil was removed; it was just after the right had been similarly dealt with that respiration ceased, cyanosis occurred, the heart stopped beating, and the pupils became dilated. The abdomen was opened five minutes later, after the ordinary means of resuscitation had been used and failed. The right hand, thrust between liver and diaphragm, easily felt the heart; it was motionless. Pressure was exerted upon the heart at a rate of about 90 squeezes a minute. For some moments there was no response; then some respiratory movements began and continued intermittently. Still there was no attempt at heart contractions. One c.c. of pituitrin was injected directly into the heart and massage renewed; after about 20 more squeezes the heart suddenly began beating strongly. Recovery followed. For the next seven days the boy was more or less unconscious. For ten days there was rigidity of the limbs or choreic movements. Frequently he cried out shrilly (meningitic cry); for 36 hours on one occasion screaming was almost continuous. For 12 days there was incontinence of fæces, and for 15 of urine too. On the tenth day he became very violent and tore his bedclothes. Improvement gradually followed and he made a perfect recovery. The recommendations, in view of this experience, which Mr. Mollison suggests are two: first, that heart massage should not be postponed too long, and, second, that massage ought always to be applied through an abdominal wound.

ANTHRAX IN MAN.

IN the *Journal of Agricultural Research* (vol. viii., No. 2, Washington) Messrs. A. Eichhorn, W. N. Berg, and R. A. Kelser, in a paper on "Immunity Studies on Anthrax Serum," state that considerable amounts of anthrax serum prepared with serum-globulin have been furnished for treatment of the disease in man with highly satisfactory results. Of the serum the curative dose is 40 c.c., administered subcutaneously in four or five places. After an interval of 24 hours a further injection of 25 c.c. may be given, repeated as often as necessary. Larger intravenous injections may be given in advanced cases. The dose of the globulin preparation is based on its proportional concentration, and is usually from 10 to 15 c.c., which can be safely given intravenously. With other types of protein absent the globulin preparation is superior to ordinary serum inasmuch as anaphylactic reaction is minimised. In a number of cases of anthrax in man treated at Bellevue Hospital, New York, it was found that a marked lowering of the temperature and reduction of the œdematous swelling followed the first injection of serum.

THE retirement will be announced shortly of Sir Arthur May, the Director-General of the Naval Medical Service, and we understand that the responsible duties which he has so ably performed will devolve upon Surgeon-General W. H. Norman, C.B.—an appointment which will be esteemed throughout the Service. Since May, 1914, Surgeon-General Norman has been in charge of the Plymouth Royal Naval Hospital.

THE QUESTION OF ECONOMY IN FOOD.

BY M. S. PEMBREY, M.A., M.D. OXON.,
LECTURER IN PHYSIOLOGY, GUY'S HOSPITAL.

IT is the duty of the medical profession to point out clearly the relation between an adequate supply of food and health and efficiency. It is a problem which has been before them for many years and has been investigated from many points of view by scientific men in this and other countries. The results give the clearest guidance in this time of crisis, but the Government have not formed a proper estimate of their value. An attempt will here be made to state clearly the results, which are not disputed, and to indicate the measures which should be employed to meet the restricted supply of food.

Food Requirements of the Body.

The combustion of foodstuffs is a characteristic of life, and in man only ceases with life itself. It is true that men may fast for 30 to 40 days without any fatal or very serious results, as the observations upon the professional fasting men have proved. Water they must have, and food they obtain by living upon their own living substance. This material consumed by a fasting man corresponds to foodstuffs which would yield 1500 to 2000 calories per day. The man is losing weight rapidly, soon becomes incapable of work, and unless the fast is broken will die. If, on the other hand, just sufficient food to maintain life be given, a man at rest in bed requires food with a fuel value of about 1800 calories per day to make good the daily loss, which is due to the "physiological work" of living. Even during the deepest sleep the body is always at work, the heart must continue to pump the blood, the muscles of the chest contract in breathing, and the glands elaborate their products. The two conditions just described give an estimate of the minimum needs of an adult.

The voluntary ration, 4 lb. bread, ¾ lb. sugar, and 2½ lb. meat per head per week, yields about 1200 calories per day, and when allowance is made for women and children is calculated to supply 2000 calories per man. It may therefore be considered a maintenance diet, and with the addition of other food will form an adequate diet for a man doing light work.

There are points of resemblance and also of difference between a man and a machine. No one expects to obtain work from a steam or petrol engine without a proportionate supply of fuel; the more work, the more fuel. There is always waste, and in respect of efficiency the engine is far behind the living body. The points of difference are enormous. The body is not only a transformer of energy, but effects its own repairs, becomes stronger with use, and even reproduces itself. The law of conservation of energy applies to man. For national efficiency the man who does essential muscular work must have a greater amount of food than the sedentary worker, and it matters not what may be their respective wages. The dietary which would be generous for a man or a horse doing no work would be slow starvation if he were forced to work hard each day. A system of rations, therefore, which pays no attention to occupation is absurd. In the following table of standards due to Atwater it will be seen that a man doing very hard work requires twice as much food as the man who does none.

Condition as regards muscular work.	Calories required per day.
None	2700
Light	3000
Moderate	3500
Hard	4500
Very hard	5500

These values are found to be necessary, as the following examples of daily rations will show.

As regards these data it is true that allowance has not been made in all cases for waste; but against this must be set the increase due to the food which is bought to supplement the ration.

[1] Part of a lecture on "The Restricted Supply of Food: its Relation to Health and Efficiency," delivered to the Royal Sanitary Institute, April 25th, 1917.

Examples of Daily Rations.

—	Protein in grms.	Fat in grms.	Carbohydrate in grms.	Calories, total.
Food supplied free, seamen, R.N.	91	48	406	2585*
,, ,, ,, boys, ,,	107	69	406	2745*
,, consumed by seamen, ,,	176	—	—	4080
Food supplied free to four British Regiments	133	115	424	3369
U.S.A. Army (peace ration)	157	140	603	4179
Ordinary prisoners, Scotland, light work, mostly sedentary	133	35	536	3115
U.S.A. labourers at hard muscular work	177	—	—	6485
U.S.A., very poor working people	69	—	—	2275
Japan, labourers	118	—	—	4415
Duke of York's Royal Military School (young men)	157	206	472	4514
Boys 9–14 years of age at English Public School	123	97	430	3400
Children over 8 years of age in L.C.C. School	88	66	377	2515

* Allowed also 4d. a day to buy extra food.

A system of rations may be necessary under certain conditions, but it is an uneconomical one, and on physiological grounds is unsound. It allows little or no free choice of food and is not readily adjusted to the various factors which determine the need of different qualities or quantities of food. Likes and dislikes are expressions of physiological needs. Healthy men are animals, and when they work steadily and well do not overfeed, even if they have free choice of abundant food. This is well shown by the fact that the average weight of the body remains very constant over long periods, it may be years, in the healthy and active adult, and likewise, as would be expected, the average consumption of food and the output of work.

The limitation of the system of rations is shown by the presence of dry canteens in the Services, the numerous eating-houses in garrison towns and ports, the parcels from home and the "tuck" shops for school-children. Rigid rations, if they are adequate for a large number of men, must lead to waste, for in no other way can allowance be made for various physiological needs.

Regulation of the Supply of Food.

The supply of food may be inadequate in quality, quantity, or in both. The foodstuffs which at the present time must be considered are wheat, meat, milk, sugar, and potatoes. A deficiency in one form of food may be covered by another article which is available. Substitution can by physiological processes be carried further than is possible by the chemist. In the living body sugar and fat can be formed from starch in the food, and the reverse processes are also possible. As a general law it may be stated that as sources of energy the foodstuffs can replace each other according to their values as producers of heat, thus the following are isodynamic quantities:—100 grms. fat, 232 starch, 234 cane sugar, and 243 dried meat. In practice an important factor is the relative cost of the different foodstuffs, which will be considered later.

For a condition of health and efficiency the food should be more than enough to cover the outgoings in the form of heat and work; a balance upon the right side is useful in times of extra or special demand. This is especially the case in the young, for if this balance is not available healthy growth is impossible. Unsuitable food, inadequate in quality or quantity or both, is recognised as one of the chief causes of the terrible mortality of children. The resistance to disease is lowered by unfeeding and lack of exercise, and there are reasons to suspect that the economy of food in schools all over the country has had, and is having, a bad effect upon the health and vigour of the children.

Many men, women, and children are doing hard muscular work which they never did in times of peace; they must have more food if they are to be efficient, and cheap food if they are to save money as they are urged by the Government.

The ideal is a liberal supply of food with free choice. This may be impossible, and the question arises, How is the supply to be regulated in the interests of the nation? The Government have wisely avoided thus far a compulsory ration, and have made attempts at control by fixed prices

and other methods. The laws of nutrition will still be in force whatever this or any other Government may do, and wisdom would lie in the recognition of the supreme power of natural law. If one foodstuff is deficient a substitute can be found in others, owing to the powers of adaptation of the body and its capacity of converting some forms of food into others. Moreover, the body as an engine can use different kinds of fuel. If coal fails steam may be generated in the engines of a ship by oil, wood, or in emergencies even by burning parts of the ship itself. From this point of view the scarcity of wheat must be considered.

Cereals.—Other corn can take the place of wheat and should be used for this purpose. There is barley and malt used for the production of alcohol, an inefficient form of food at the best and a deadly poison in excess. According to the Food Controller there are 1,000,000 quarters of brewers' malt in this country at the present time; it is not to be used for food, but for the production of beer. The convictions for drunkenness in the Metropolitan Police district and the City for the first quarter of this year were 6176. The Food Controller says that the food value of beer is not disputed, and the Government does not consider it is necessary to save the millions of quarters of barley, malt, and other foodstuffs which are used in the manufacture of alcohol. There may be reasons of policy for allowing alcohol to men in the Services or employed in some essential occupations, but there is none for its widespread consumption. An underfed nation is more dangerous and inefficient than well-fed men, some of whom are aggrieved because they cannot obtain their beer.

Oats can be used as a substitute for wheat, but there is difficulty in obtaining a ready supply; the oats are being kept for the horses. A horse may consume 40 to 80 lb. of oats per week, and hunters and racehorses receive the best. Hunting and racing have been and are allowed; only now is the Government taking steps to consider whether savings in this respect should be effected in the interests of the food-supply of the people. There are thousands of hunters, racehorses, riding horses, and carriage horses used only for pleasure in this country; the consumption of oats, maize, beans, hay, straw, and carrots by these animals must be enormous. With the exception of the hay and straw, which would be useful for cows, all these tons of food could be used by man himself; the objection that the horses are needed as a reserve for breeding and for the Army has no force, for all of these animals could be kept at grass, and under these conditions would liberate many men for essential work.

The percentage composition of these cereals is as follows:

	Protein.	Fat.	Carbohydrate.	Fuel value per lb. Calories.
Wheat flour... ...	8·3	1·0	73·5	1615
Barley, pearled...	6·6	1·0	76·1	1630
Maize flour	5·8	1·2	76·3	1625
Oatmeal...	13·4	6·6	65·2	1795

All of these substances have been used, even in times of peace, as substitutes for wheat. In some respects oats are a better food than wheat, and the fuel value of one pound is greater than the total for one day of the voluntary ration suggested by the Food Controller. A horse eating daily 10 lb. of oats consumes an amount of cereal food which would be sufficient for 10 to 20 men.

Sugar and Potatoes.—Sugar and potatoes are foods which were introduced into this country in times relatively recent, and it is obvious that they are not so essential as some people imagine. The children should have first claim on sugar, and they could also obtain milk-sugar in milk and malt-sugar in malt, besides those essential substances known as "vitamines." Substitutes for potatoes can be found in other vegetables and the carbohydrates of cereals.

Milk.—The supply of milk is another difficulty, and it has received the attention of the Government. A maximum price has been fixed for the retailer and the producer; the farmers have been selling their cows and giving up the production of milk, notwithstanding the fact that it was a very lucrative business, according to many writers to the daily press. For young children, invalids, and our sick and wounded soldiers milk is a food for which no efficient substitute can be found. During the spring and summer months there may be no serious shortage, for those are the best months, when the cows are at grass, the supply is large and feeding is cheap. There is a shortage at the present time and the coming autumn and winter will show the effects of the reduction of the milking herds. Action, however, must be taken now. Heifers cannot be made into milch cows under ten months. The Government have revised their "milk orders"; the farmers ask for the recall of these orders. In any case a reserve of cows could be provided by the end of next winter if the Government purchased at once numerous heifers and turned them out to graze with young bulls on land owned or taken over by the Government. Even if money were an object the transaction would be probably a very profitable one. A supply of milk should be safeguarded and its cost should be low for the sake of the children, even if it be necessary for the State to give a subsidy.

Other Measures.

If the scarcity of food is general, the true remedy lies in an extension of the supply. Action has been taken at last, pasture has been ploughed up, but the highly fertile ground of the hop-gardens will apparently in many cases still grow hops for beer, instead of corn or potatoes for bread. The hop-growers should have compensation if necessary, but food they should grow, for it is food which is needed.

Another source of food which is undeveloped is the salt and fresh water fish, but this, owing to the supply of cattle, is not so urgent as the question of cereals.

If the cost of food continues to rise difficulties of a serious kind must occur, for a strong man is liable to become dangerous when he is hungry. A corresponding rise in wages does not meet every difficulty. The wage is not adjusted to the size of the breadwinner's family. A great relief and a true safeguard for the present and the future would be the free supply of dinner and tea to school-children; the necessary machinery is simple, if the expense is a general one borne by the State. The health of the future generation could be secured, a great burden would be taken from many hard-working and deserving parents. Foodstuffs which the labouring classes cannot obtain readily or cook could be used in these free meals, and bread would be saved. There would be no danger that the children would be overfed; healthy children are active and growing, and the law of averages as regards food would hold good.

Petty orders, such as the prohibition of Sunday-school treats and cakes, show no appreciation of the laws of nutrition and cause an amount of irritation out of all proportion to the result obtained. The owner of poultry is not allowed corn; the hen does not return in eggs the food value of the food consumed; no animal ever did or ever will, for it must have some for its life, but when allowance is made for the consumption of refuse the hen is economical. The owner of race-horses, hunters, and other horses used for pleasure is allowed in unlimited quantities the very best corn he can buy; he takes the food from the mouths of the poor by outbidding them in the purchase of some of the best articles of food and at a time when there is a great scarcity.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Maintenance of Irish Asylums.

A SERIOUS financial position has arisen with regard to the Government grant for the maintenance of Irish asylums. The grant has come from an account known as the Local Taxation Account, and the amount payable has been practically stereotyped, regardless of the increasing expenditure of the asylums. At the time the grant was fixed it was sufficient to bear about half the cost of maintenance of asylum patients, but for several years prior to the war this cost was gradually increasing. With the present rate of prices the cost of maintenance has more than doubled since 1914, while the Local Taxation Account, owing to the falling-off in the revenue from licences and other local duties, is no longer able to bear even the stereotyped charge. Up to 1899 the State grant and local rates each contributed about 4*s*. per lunatic per week, whereas it is calculated that in the present year the State will only pay 3*s* 6*d*. per head, and the balance, at least 13*s*., must be borne by local rates. The asylums are not alone in misfortune owing to the failure of the Local Taxation Account. Grants are also paid toward

the salaries of Poor-law medical officers and workhouse nurses and of workhouse school teachers, toward the cost of medicines for Poor-law patients, and for some other purposes. All these will suffer, but not to the same extent as the asylums.

The Public Health of Belfast.

That the condition of Belfast from a public health point of view is anything but satisfactory at present is clear to anyone reading the articles appearing in the local papers and also from a perusal of the discussion which occurred at the monthly meeting of the city council on May 1st. Between March 18th and April 21st of this year the average annual death-rate from all causes was 21·8, while in the corresponding period of 1916 it was 20·7; and 188 cases of infectious disease were notified, compared with 115 in the previous five weeks and 169 in the corresponding period of 1916. Altogether 37 cases of typhus had occurred in the recent epidemic, while upwards of 100 new cases of typhoid have been notified during the eight weeks up to the middle of April. The chairman of the Public Health Committee was unable to assign any cause for the origin of the typhus outbreak beyond the fact that ships came to Belfast from foreign ports, which might have brought the disease to the city—an explanation sufficient to cover the occurrence of any form of infectious disease in any maritime town at all times and seasons. As to the typhoid, in the district principally affected—Ballymacarrett—the health committee put forward as an explanation the eating of shell-fish, a view medical expert opinion in Belfast would certainly not endorse. Nothing was said as to insanitary domestic conditions. Then one of the aldermen of the city council made a very severe attack on the corporation scheme for dealing with tuberculosis, which began in May, 1913. The scheme was, he said, costing £31,600 a year now, instead of £15,000 as formerly, without obtaining any results, and he mentioned that in the first quarter of 1917 the death-rate from tuberculosis had exceeded anything experienced for the past 15 years. In 1911 the deaths from phthisis in Belfast were 802, while in 1916 they were 828, and during the three months from Dec. 16th, 1916, to March 16th, 1917, 290 deaths occurred from pulmonary tuberculosis, a figure much above the average. The monthly figures were respectively 93, 85, and 112. In 1914, from the middle of January to the middle of March, 139 deaths took place from phthisis, while during the same period in 1917 there were 197. The corporation scheme for dealing with infantile mortality has not yet been launched, and although £32,000 a year are being paid for street cleansing, not a municipal water-cart was used until last week, and dust, full of microbes, was being blown into the houses. In a word, notwithstanding that more money is being spent, the public health of Belfast is not improving, and no real scientific attempt is being made to grapple with the great questions of public health that are now being considered in England and Scotland.

Belfast and the War Office.

The action of the War Office in dealing with Irish medical schools and with Irish doctors requires some explanation, as is apparent from what appears in THE LANCET of May 5th, p. 704, where, in reference to a Dublin hospital for France, it is said a similar offer on more than one previous occasion was refused when made by Dublin, and also when offered by Belfast in 1915, and by Cork more recently. Not only are these facts accurate, but it may be added that again last week Sir Alfred Keogh, Director-General A.M.S., refused a second offer from the medical profession in Belfast. As a result, the president of the Ulster Medical Society has written Lord Derby, asking him to explain his letter urgently calling for doctors, with this refusal on the part of the heads of the Royal Army Medical Corps, at the War Office to accept the second offer from the members of the Belfast Medical School. Another matter causing great annoyance is the fact that experienced hospital surgeons, who on high patriotic grounds have offered their services, are told that they can join with the rank of their pupils a few days qualified, and go to a camp to be trained, when some of them thus treated have actually been doing all the operative work at the Belfast Military Hospital. At the same time the ranks of lieutenant-colonel and captain are given to others on their first appointment as temporary medical officers of the Royal Army Medical Corps.

Correspondence.

"Audi alteram partem."

THE NEGLECT OF VACCINATION.

To the Editor of THE LANCET.

SIR,—The Local Government Board has recently inquired from the local authorities as to the isolation accommodation for small-pox cases, and the replies generally in the West of England cannot, it seems, be described as satisfactory. This is to be much regretted, as owing to the decrease in vaccination it is essential that adequate isolation should be provided. The neglect of vaccination has probably not had the attention it demands, and this is the feeling of public vaccinators in most districts. In several towns in the West the number of conscientious exemptions exceed largely the number of successful vaccinations. It would be as well to have the term conscientious objection more clearly defined, often it is only ignorance that is implied when the expression is used. A man told me that he never had his children vaccinated; he had a "conscientious objection" to the operation, as he did "not want matter put into his children's arms." This parent was a member of a board of guardians, and had voted against vaccination whenever that subject was discussed at the meetings. Legal proceedings are practically never taken against parents for neglecting to have their children vaccinated, and perhaps this is wise, for the delinquents have often been fined a few coppers, and these fines are paid by the antivaccination societies.

The operation of vaccination is performed differently by many medical men; the public vaccinator has to make four marks, the private practitioner has liberty to make the number he prefers. In some centres there are one or two medical men who vaccinate in one place, and they vaccinate hundreds of children annually. I have seen the resultant scars of some of these cases, and they are almost microscopical in size. These vaccinations might be described as evasions of the law, and the protection conferred by them against small-pox must be extremely limited. After the war the whole subject of the performance of vaccination will have to be gone into, for the annual returns show a large decrease every year in the number of successful cases. The question would then be discussed as to whether any certificate of successful vaccination should be accepted unless it states the number of marks obtained, this number to be fixed by the authorities.

Another point open for debate is whether the public vaccinator should not be abolished, and the parents allowed to have their own medical attendant to perform the operation, the fees being paid by the State. This would make vaccination more popular with the parents, as the family practitioner would be preferred to the public official.

Doubtless several changes will occur in the administration of the Vaccination Acts, and if vaccination could be carried out more efficiently and revaccination enforced, the isolation accommodation at present available would be probably more than sufficient. I am, Sir, yours faithfully,

Lyme Regis, May 4th, 1917. JAMES D. STAPLE.

THE TECHNIQUE OF LUMBAR PUNCTURE.

To the Editor of THE LANCET.

SIR,—The contretemps which Mr. Sheffield Neave has experienced (THE LANCET, May 5th) must be, I think, very unusual, and it is remarkable that it has occurred in his practice three times. It is unlikely that he has met with three cases of congenital abnormality of the vertebral column, which have required lumbar puncture. It is also unlikely that he has struck an intervertebral disc without blunting his needle considerably. It is more likely that he underestimated the distance across the bony canal. I entirely agree with him in his remark about the value of revolving the needle in order to establish or increase the flow of fluid. Another device for the same purpose is to make the patient cough, or, if he is sitting up, to get him to raise his head slightly. It is useful to make a practice of operating below the fourth lumbar spine. Frequently when blood is met with here the fluid will be clear at the higher levels. This, no doubt, is

more often the case when the patient is sitting up on a stool. I always use a syringe as a handle for the needle. It serves also to wash the needle through when a fresh puncture is necessary and at the completion of the operation. Several sterilised test-tubes should always be at hand. It must be remembered that a little blood does not interfere at all with the cytological examination of the fluid or of the Wassermann reaction. In the former case the necessary adjustment can be made readily by simple arithmetic; for the Wassermann reaction the pathologist requires to have the fact that the fluid contained blood in his mind when he reads off the result of the test. To my mind the "Barker" needles are needlessly large. Fine needles of platinum-iridium, which I first saw used by Colonel Purves Stewart five years ago, make lumbar puncture practically a painless operation. The skin is sprayed with ethyl chloride. Over and over again patients have told me that they felt no pain whatever, and a medical man, whom I punctured recently, told me at the end of the operation that he did not know that I had commenced. The fineness of the needles has, in my hands, offered no difficulty in the case of intrathecal injections. My two needles, which are in use almost daily, are those which I bought five years ago. About once a year they require straightening out. Personal attention to one's needles is essential.

The high incidence of neurological syphilis in the Navy brings with it a large experience of lumbar puncture work. In the last ten months at Haslar, for instance, we have done some 250 lumbar punctures in the neurological department. In only one case was the resulting discomfort sufficient to cause the patient to ask that the operation might not be repeated. I agree with Dr. T. J. Horder (THE LANCET, April 28th) that a "dry puncture" is another word for an unsuccessful operation. With reference to Surgeon F. A. Williamson's dilemma (THE LANCET, April 21st), surely a "mistake in diagnosis" should not occur if the cytology of the fluid is examined. This is of far greater importance than the estimation of the pressure of the fluid. The determination and the enumeration of cells requires only a bottle of stain, a graduated pipette, an ordinary hæmocytometer, and a microscope with a 1/6th inch objective.

I am, Sir, yours faithfully,

HILDRED CARLILL, M.A., M.D. Cantab., M.R.C.P. Lond.,
Neurologist to the Royal Naval Hospital, Haslar.

R.N. Hospital, Haslar, May 6th, 1917.

THE USE OF STATISTICS IN MEDICINE.

To the Editor of THE LANCET.

SIR,—This is not the time, nor can you provide the space, for a discussion of the proper use of statistical methods. The "wise sayings" of Sir Almroth Wright which you endorse have already been commented upon at length by me in your columns (January, 1913). But I do venture to ask, in all seriousness, whether this is the time once more to trot out that pantomime elephant, the imaginary "statistician," who insists on masses of heterogeneous data and refuses to pay attention to small groups of homogeneous observations and to contrast that comic animal with the expert (also imaginary) who can deduce absolute truth from half a dozen intensively studied cases.

I do not blame your contributor for not knowing that for several years English statisticians have been at work on the problem of the small sample, any more than I blame the publicity department of the Food Ministry for issuing guesses as to the quantity of food wasted in private families without studying the exact investigations of this point published 17 years ago by Atwater's collaborators; nobody can be expected to read the literature of a subject upon which he means to advise the public—it would bias him. But if I go to the expense of having six absolutely true dice cut, and if on the first trial they all throw a 5, and I at once recommend the gambling public to put their money on 5 in future dicing, I wonder whether your contributor will contrast me advantageously with Weldon and other statisticians who went to the trouble of making thousands of tosses with the ordinary dice of commerce, and whether he will draw that moral of his—viz., when a shorter and a longer way are open, it is not well to choose the longer. On the whole, I do not think he will. But if I were to say that a profound knowledge of the peculiarities of dice, *my* dice, had satisfied me that it really was a certainty that the 5 would turn up and that other observations inconsistent with this view were due to want of technical knowledge on the part of the observer, he would no doubt take my word. Perhaps the gambler would, too, and perhaps he would not be *quite* satisfied in the long run.

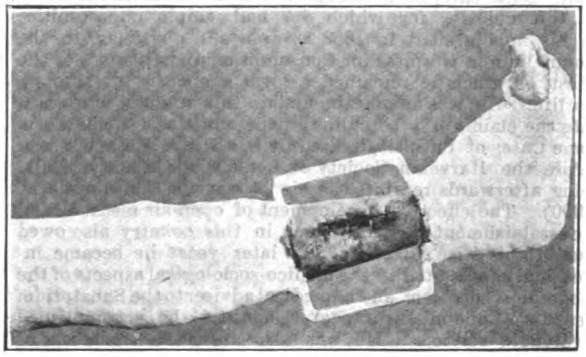
I am, Sir, yours faithfully,

Lister Institute, S.W., May 5th, 1917. M. GREENWOOD, Jr.

BRIDGED PLASTER SPLINTING.

To the Editor of THE LANCET.

SIR,—Referring to the method of plaster splinting described by Captain George Davis in THE LANCET of Feb. 24th I may say that this method of applying plaster has been in use in Boston, Mass., for a number of years and it was when I was a student in Boston that I learned this method. It was used extensively at the American Ambulance in Paris by Dr. Osgood, of Boston, when he was on service there. I have referred to bridged plaster in my recent book on Military Surgery, and the appended photograph shows the splint in use.—I am, Sir, yours faithfully,



Bridged plaster splint applied for an infected gunshot wound of the leg in order to facilitate dressing and at the same time immobilise the fragments.

D. PEARCE PENHALLOW,
Chief Surgeon, American Women's War Hospital.

Oldway House, Paignton, South Devon, April 14th, 1917.

A SIMPLE METHOD OF APPROXIMATING THE EDGES OF WOUNDS.

To the Editor of THE LANCET.

SIR,—I venture to suggest a mode of uniting the edges of wounds which is original, though perhaps not new. It is especially useful with children and in cuts or operations about the face where stitch marks are sometimes more noticeable than the actual scar of the wound.

After preparing the wound, take a suitable number of pieces of silk thread about 4 in. long, each with a knot at the end, and arrange them across the wound just where stitches would be placed. Then fasten down the knotted ends with strapping ¾ in. broad, with its edge half an inch from the wound, and turn the loose ends back. Having similarly prepared the other side, it only remains to draw the edges of the wound together and tie the ends in pairs. For small operations one has time to adjust the silk ends and strapping ready for use, and the former may be passed through the strapping to make it even more secure. I have always used Johnson's adhesive strapping, which keeps the silk quite firm, only the latter must not be wet.

This method might be used for larger wounds to supplement stitches, or to replace those which have given way, or to relieve tension. I am, Sir, yours faithfully,

GEORGE A. BALLINGALL.

St. Leonards-on-Sea, May 2nd, 1917.

THE American National League of Nursing Education has elected Mrs. Bedford Fenwick as their first honorary member in recognition of her labours for the higher education and registration of nurses. The League is composed of all the leading superintendents of training schools for nurses in the United States.

Obituary.

JOHN EDWARD SQUIRE, C.B., M.D. LOND., F.R.C.P. LOND., D.P.H. CAMB.,

CONSULTING PHYSICIAN, MOUNT VERNON HOSPITAL FOR CONSUMPTION, ETC.

WITH the death of Dr. J. E. Squire at his house in London on May 2nd, at the age of 62, the medical profession is the poorer by the loss of one who may justly rank with the pioneers in the modern study and hygienic management of tuberculosis.

John Edward Squire was born in 1855, the son of the late Dr. William Squire, and was brought up in a medical atmosphere with the best of professional traditions. He was educated at University College, London, obtaining his M.B. Lond. in 1881 and his M.D. in the following year, when he became house physician at University College Hospital. Quite early in his career he was attracted to the study of tuberculosis, for which he had ample opportunities on his appointment in 1882 as assistant physician to the Mount Vernon Hospital for Consumption and Diseases of the Chest, of which he remained a loyal supporter all through his life. He was among the first in this country to investigate the claims of tuberculin, a paper entitled "Remarks on Some Cases of Phthisis, treated by Dr. Koch's Method," read before the Harveian Society of London in January, 1891, being afterwards reprinted in his "Essays on Consumption" (1900). The effective development of open-air methods and the establishment of sanatoriums in this country also owed much to his wise advocacy. In later years he became increasingly interested in the medico-sociological aspects of the tuberculosis problem, and as medical adviser to the Sanatorium Benefits (London Insurance) Committee he accomplished invaluable service. He was also an active member of Council of the National Association for the Prevention of Consumption, and a corresponding member of the International Association for the Prevention of Tuberculosis.

Dr. Squire construed his civic duties in a wide sense. In 1885 he served as senior medical officer under the Red Cross in the Soudan Campaign, obtaining the Egyptian medal and the Khedive's bronze star. From 1898 to 1904 he devoted much time and energy to the development of London companies of the R.A.M.C., and on retiring was granted the C.B. and a Volunteer decoration. This service gave him the necessary experience to write a useful manual entitled "Medical Hints to Medical Officers temporarily employed with Troops," issued in 1915 as an Oxford War Primer, his last published writing. Among other awards he received the Queen Victoria Jubilee medal, the King Edward VII. Coronation medal, and King George V. Coronation medal. He was also a Knight of Grace of the Order of St. John of Jerusalem. In addition to the books already mentioned Dr. Squire made many contributions to contemporary medical literature, of which his "Hygienic Prevention of Consumption" (1893) and "Preservation of Health" (1900) attracted most attention. A valuable paper on the "Incidence of Tuberculosis in Children" appeared in our columns in 1910.

One of his colleagues and personal friends writes :—

For over 20 years it has been my privilege to have been closely associated with the late Dr. Squire as a colleague and in private life. He was one of the most hard-working and energetic men whom I have ever met. A glance at the number and variety of the appointments which he held from time to time, and to all of which he devoted himself with self-sacrificing zeal, will show that he was a man who sought a multiplicity of duties, though his name is associated chiefly with tuberculosis and though in later years his professional work was almost entirely in this direction. For example, he took a foremost part for many years in the organisation of the R.A.M.C. (T.) and was, I believe, on his retirement the senior officer in that branch of the service. At the time of the South African War he was largely instrumental in organising and sending out a Territorial Unit, for which work, among other things, he received the C.B. Of late years much of his time was devoted to the activities of the London Insurance Committee, where these had reference to the tuberculosis and sanatorium benefits under the Act. Here his talent for organisation was of the greatest service, for the general campaign for the prevention of consumption was one of his most profound interests. He took a very active part in the foundation of the St. Marylebone Dispensary, of which he was chairman for some years, and recently had been working very hard over the starting of a scheme for the after-treatment of the tuberculous when they had been discharged from hospitals and sanatoria. When it was pointed out to him that, in spite of all his work, his name did not appear prominently in the matter, it was characteristic of him to reply, "That does not matter so long as the work gets done," and it was a source of the greatest gratification to him to see the practical progress that was being made. He was a most conscientious man, and, perhaps, incurred the charge of being changeable from the fact that he examined every problem closely, and was prepared to revise his judgment. He was not an accessible man; there was a certain aloofness and even brusqueness in his manner upon occasion, and these two characteristics, great conscientiousness and a kind of shyness, led to his being often misunderstood by those who only knew him slightly. He was really a very sensitive and highly-strung man, with very strong feelings and affections. The loss of his only son at Neuve Chapelle was a blow from which he had not recovered when his own time to pass over came suddenly in the midst of his labours. His memory will always be held in affectionate esteem and respect by all those who really had his friendship.

Concerning his personal qualities, another of his colleagues at the Mount Vernon Hospital writes :—

Dr. Squire possessed a genius for taking pains. Cautious, patient, reliable as a clinician, he was an able organiser and a tactful administrator. As a teacher he was lucid in exposition and ever ready to devote time and thought to the consideration of essential details. He was, as a result, much in demand as a lecturer. By his premature death medical science has sustained a heavy loss and the health service of the community has been deprived of a man who gave his best for the sake of the people. He died as he would have wished, in harness, a valued companion and trusted counsellor to the last.

Dr. Squire married in 1894 Mary Lily Youngman. His widow and two daughters survive him, and for them the deepest sympathy will be felt.

THE LATE MR. F. W. FOWKE.—On April 27th there passed away at his residence, Byfield, Northants, at the age of 73, Frederick William Fowke, M.R.C.S. Eng., M.R.C.P. Edin., L.S.A. Lond., who had, until his retirement in 1900, been for many years a highly trusted practitioner of the neighbourhood. Born in 1844, the eldest son of the late Frederick Gustavus Fowke, of Charlwelton, he was educated at Leamington, later qualifying as a medical man after studentship at Guy's Hospital. He practised in Byfield from his hospital days, and his services were widely known and valued among all classes. He leaves a widow and three sons.

URBAN VITAL STATISTICS.

(Week ended May 5th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 15·7, against 18·4 and 16·7 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 15·4, or 1·4 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 7·5 in Wallasey, 7·9 in Eastbourne, and 8·0 in Ealing to 23·5 in Middlesbrough, 23·6 in Halifax, and 25·5 in Stockton-on-Tees. The principal epidemic diseases caused 450 deaths, which corresponded to an annual rate of 1·4 per 1000, and included 280 from measles, 64 from infantile diarrhœa, 63 from whooping-cough, 33 from diphtheria, 7 from scarlet fever, and 3 from enteric fever. The deaths from measles were slightly in excess of the number in the previous week, and caused the highest annual death-rates of 3·4 in Salford, 3·6 in Middlesbrough and in Sunderland, 3·8 in South Shields and 6·2 in West Bromwich. The 739 cases of scarlet fever and 1203 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 19 above and 9 below the numbers remaining at the end of the previous week. Of the 5119 deaths from all causes in the 96 towns, 158 resulted from violence. The causes of 39 deaths were uncertified, and included 10 in Birmingham and 4 each in Liverpool and Sunderland, but not one in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 17·2, against 18·1 and 18·4 per 1000 in the two preceding weeks. The 399 deaths in Glasgow corresponded to an annual rate of 18·6 per 1000, and included 38 from whooping-cough, 33 from measles, 3 from diphtheria, and 1 from scarlet fever. The 120 deaths in Edinburgh were equal to an annual rate of 18·9 per 1000, and included 25 from measles, 7 from whooping-cough, 2 from infantile diarrhœa, and 1 from diphtheria.

Irish Towns.—The 163 deaths in Dublin were equal to a rate of 22·0 or 1·6 per 1000 above that recorded in the previous week, and included 8 from measles, 3 from whooping-cough, and 1 from diphtheria. The 125 deaths in Belfast corresponded to an annual rate of 16·6 per 1000, and included 3 each from enteric fever and infantile diarrhœa, and 1 each from scarlet fever and typhus.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Capt. E. Harrison, R.A.M.C., attached Gloucester Regiment, was educated at Cambridge and at St. Bartholomew's Hospital, London, and qualified in 1904. He held appointments at the Hospital for Women, Soho, London, and at the Scarborough Hospital, and was in practice at Leicester prior to joining the R.A.M.C.

Lieut.-Col. (acting Col.) F. A. Symons, R.A.M.C., C.M.G., D.S.O., A.D.M.S., qualified at Edinburgh in 1891. He joined the R.A.M.C. in 1893 and was promoted Lieutenant-Colonel in 1915. He saw service in the South African War, taking part in the relief of Ladysmith, and received the Queen's medal with three clasps. He was awarded the D.S.O. in February, 1915 (THE LANCET, Feb. 27th, 1915, p. 469), and the C.M.G. at the close of last year (THE LANCET, Jan. 6th, 1917, p. 37).

Capt. P. E. Lones, R.A.M.C., was a student at University College Hospital and qualified in 1915, and thereupon joined up.

Died of Wounds.

Capt. J. B. Tackaberry, I.M.S., was a student at Middlesex Hospital and qualified in 1909. He joined the Indian Medical Service in 1910 and was promoted Captain in 1913.

Surgeon-Major A. H. Palmer, Staffordshire Yeomanry, was educated at Birmingham University and at Guy's Hospital, London, and qualified in 1895. He had been associated for some years with the Yeomanry, and died at Cairo on May 2nd.

Lieut. J. A. S. Burges, qualified at Glasgow in 1910, and held appointments at the Consumption Sanatorium, Bridge of Weir, and at the Glasgow Western Infirmary and the Glasgow Maternity and Women's Hospital. Prior to joining the R.A.M.C. he was in practice at Carronshore, Stirlingshire, and was medical officer of the parish of Airth.

Died as Prisoner in Turkish Hands.

Capt. K. K. Mukerji, I.M.S.

Missing, believed Drowned.

Lieut. J. Marshall, R.A.M.C., was educated at Edinburgh University and qualified in 1908. He was at one time house surgeon at the Darlington Hospital and later was in practice at Lancaster. Before joining the R.A.M.C. just recently he was on the staff of the Beaufort Military Hospital, Bristol.

Lieut. J. Rae, R.A.M.C., was educated at Aberdeen University and at University College, London, and qualified in 1909. He held appointments at the Cheltenham General Hospital, at the Connaught Hospital, Aldershot, and at the Park Hospital for Children, and was on the staff of the 1st Birmingham War Hospital before joining the R.A.M.C. in February last. He had made several contributions to medical and to other literature.

Lieut. M. W. Danzig, R.A.M.C., came from South Africa and qualified at Edinburgh in 1915, and joined the R.A.M.C. so recently as March last.

Lieut.-Col. A. C. Fox, D.S.O., R.A.M.C., was a student at the London Hospital and qualified in 1891. He joined the R.A.M.C. in 1894 and was gazetted Captain in 1897 and Lieutenant-Colonel in 1915. He was awarded the D.S.O. in February, 1915 (THE LANCET, Feb. 27th, 1915, p. 469).

Lieut. W. Grier, R.A.M.C., was educated at Glasgow University and qualified in 1905. He held appointments at the Eye Infirmary, at the Western Infirmary, and at the Maternity Hospital, Glasgow, and was in practice at Barrhead prior to joining the R.A.M.C. in the early part of this year.

Lieut. W. T. Harris, R.A.M.C.

Lieut. J. G. B. Smith, R.A.M.C., was a student at St. Bartholomew's Hospital, London, and qualified in 1915. He joined up quite recently.

Lieut. R. Stewart, R.A.M.C.

Wounded.

Capt. H. E. Creswell, R.A.M.C., attached K.R.R.C.
Capt. W. T. Collier, R.A.M.C.
Capt. R. H. MacDonald, Canadian A.M.C.
Capt. A. H. Wallace, Canadian A.M.C.
Capt. H. C. Wallace, Canadian A.M.C.
Capt. G. B. Lowe, Australian A.M.C.
Capt. F. E. S. Willis, R.A.M.C.
Capt. J. Fraser, M.C., R.A.M.C. attached Devon Regt.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Lieut. J. L. Fowlie, Highland Light Infantry, elder son of Dr. P. Fowlie, of Singapore.

Second Lieut. D. N. O'N. Humphrey-Davy, Hampshire Regiment, younger son of Dr. A. Humphrey-Davy, of Bournemouth.

Capt. L. Profeit, King's Shropshire Light Infantry, youngest surviving son of the late Dr. A. Profeit, Commissioner to Queen Victoria at Balmoral.

Second Lieut. H. W. F. Cooper, Royal Fusiliers, only child of the late Mr. T. H. Cooper, M.R.C.S., of Hampstead, London.

Surgeon-Major A. H. Palmer, Staffordshire Yeomanry, eldest son of Dr. C. Palmer, of Burton-on-Trent.

Capt. G. L. Pagan, Royal Scots, son of the late Dr. Pagan, of Bothwell, Lanarkshire.

Capt. P. A. Hill, South Wales Borderers, only son of Col. P. E. Hill, A.M.S., of Crickhowell, Breconshire.

Second Lieut. G. H. Mapleson, Queen's Royal West Surrey Regt., youngest son of the late Dr. H. T. Mapleson, of Nottingham-place, London.

Lieut. W. D. L. Purves, East Lancashire Regt., youngest son of Dr. W. L. Purves of Stratford-place, London.

Lieut.-Col. M. E. McConaghey, D.S.O., Royal Scots Fusiliers, second son of the late Col. J. McConaghey, R.A.M.C.

THE HONOURS LIST.

The following award to a medical officer is announced:—

C.M.G.

Lt.-Col. Henry Arthur Powell, Australian A.M.C.

FOREIGN DECORATIONS.

By the President of the French Republic.

Legion d'Honneur.—Croix de Chevalier: Capt. V. B. Green-Armytage, I.M.S.; Lt.-Col. A. Mignault, Canadian A.M.C. *Croix d'Officier:* Col. H. D. Rowan, A.M.S.

Croix de Guerre.—Capt. A. C. Armstrong, Canadian A.M.C.; Temp. Capt. H. L. G. Hughes, D.S.O., R.A.M.C.; Temp. Capt. B. B. Noble, R.A.M.C.; Temp. Capt. R. R. Scott, R.A.M.C.; Temp. Capt. (temp. Maj.) A. G. Whitehorne-Cole, R.A.M.C.; Maj. H. H. Woollard, Australian A.M.C.; Temp. Lieut. St. J. D. Buxton, R.A.M.C.; Temp. Capt. K. G. Fraser, R.A.M.C.; Temp. Capt. W. A. L. H. Henderson, R.A.M.C.

THE PARIS CONFERENCE ON THE WAR CRIPPLE.

The proceedings of this inter-Allied conference opened on Tuesday with a *séance solennelle* at the Grand Palais, attended by the President of the French Republic. The delegates of the Allied Governments are as follows:—

Great Britain: Sir A. Keogh, G.C.B.; Fleet-Surgeon Percy H. Boyden, R.N.

Canada: Lieutenant-Colonel F. G. Finlay, C.A.M.C.

Italy: Professor Commandore E. Burci, Dr. Chevalier Guido Mendès.

Roumania: Dr. Marinesco.

Russia: M. le Chamtellan Bereznikow, Russian Red Cross; Professor Polienow.

Serbia: Colonel V. Soubotitch, Director-General Surgical Service of Serbian Army; M. Sava Ourotschevitch, Professor of University of Belgrade; M. Véllzar Jankovitch.

Besides the official delegates 700 unofficial delegates are attending the congress.

GLASGOW WAR RELIEF FUNDS.—A statement prepared by Mr. John S. Samuel, of the City Chambers, Glasgow, for the Lord Provost of that city shows that the amounts raised by various war relief funds from August, 1914, to December, 1916, total £2,550,199, or approximately £2 6*s.* per head of the population, a praiseworthy record.

WAR HOSPITALS IN THE EAST.—The officers' hospital in Busra has accommodation for about 50 officers, and is set apart for the nursing of acute cases only. The convalescent hospital at Beit Naama can take twice the number, and now possesses a launch, which every morning takes patients down from the hospital. Two of the Indian hospitals have an overflow barge-ward, which is much appreciated. Several English nursing sisters are now working in the Indian general hospitals.

The Indian Red Cross.—A branch of the Red Cross Society in Bombay has undertaken the important work of verifying the official reports of missing men by systematic inquiries covering the whole journey from the fighting line to the base depôts and hospitals, and from there to the invalid and convalescent camps in India.

OBITUARY OF THE WAR.

MICHAEL JOSEPH WHITTY, M.D., M.CH. R.U.I.,

LIEUTENANT-COLONEL, ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel M. J. Whitty, who died a month ago at Liverpool, was 54 years of age. He studied at Queen's College, Cork, and the Catholic University, Dublin, obtaining his qualification in 1884. Two years later he joined the Royal Army Medical Corps, retiring in 1906 after 20 years' service, when he was enrolled in the Reserve of Officers. At the outbreak of war he was appointed medical inspector of recruits for the Western Command, and was mentioned in a recent *Gazette* for his strenuous work in this capacity. In Liverpool, where he lived for many years, he was known as a kind and genial man and an up-to-date medical officer.



WILLIAM BROWN CLARK, M.B., B.S. LOND.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain W. B. Clark, who was recently killed in action in France, was younger son of Dr. G. B. Clark, ex-M.P. for Caithness-shire and Consul-General of the South African Republic. Educated at Lynton House and King's College Schools, he continued his medical studies at King's College Hospital, qualifying in 1903, when he obtained a house appointment at his hospital. He graduated M.B., B.S. Lond. two years later, going abroad to study neurology under Professor Edinger, at Frankfort. While there he contributed some articles on the origin of the cerebellum in animals to the *Journal of Anatomy and Physiology*. In 1907 he took charge of the Neurological Laboratory in King's College, carrying on experiments for Sir David Ferrier. It was his habit to practise during the winter at Villars (Switzerland) and Varenna (Italy), spending his summers in this country. When the war began he joined the Wounded Allies Relief Committee, proceeding to Antwerp, which place he left by the last steamer before its capitulation. He then went to Ostend and his report to the committee on the terrible condition of the Belgian wounded in that place was brought to the notice of the British Government, with the result that Captain Clark and his brother-in-law, Major W. A. Brend, filled the first transport of Belgian wounded at Ostend and brought it over to Dover. The difficulties of this task were graphically described by Major Brend in the *Nineteenth Century* of January, 1915.



Captain Clark joined the Royal Army Medical Corps in September, 1914, and held various appointments in hospitals, field and motor ambulances. At the time he was killed he was attached to a battalion of the Scots Guards. His chief wrote that though only a few months with the division, his sterling qualities and capabilities had proved a valuable asset to its medical staff. In 1906 Captain Clark married Ethel Vera, daughter of D. C. Howat, of Glasgow, and leaves a little daughter.

THOMAS GEORGE SMITH HODSON, M.D. DURH.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain T. G. S. Hodson, who lost his life by the sinking of the hospital ship *Salta* on April 10th, at the age of 53, was a son of the late William Hodson, of Downhills, Middlesex. Educated privately, he studied medicine at the London Hospital, taking his M.B. Durh. in 1893, and his doctorate five years later. He then practised for a time at Buxton and Bitterne (Hants), where he held several public appointments before settling in London. In June, 1915, he joined the Royal Army Medical Corps and was for some time attached to the Royal Victoria Hospital, Netley, afterwards serving on the Recruiting Medical Board at Bristol. Returning to Netley, he answered the call for volunteers for transport work, and was attached to the *Carisbrooke Castle*. In April he was appointed to the *Salta*, on which he had only been four days when the vessel was sunk in the Channel. A medical friend, who knew Captain Hodson for 20 years, writes that he never heard him speak a harsh word of anyone. Captain Hodson married in 1906 Margaret Mary, daughter of the late Dr. Samuel Hyde, of Buxton, and leaves two daughters and one son.



HARRY GRAHAM SMITH, L.R.C.S. EDIN., L.D.S.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain H. G. Smith, who lost his life by the sinking of the hospital ship *Salta* in the English Channel on April 10th, was a son of the late Dr. John Smith, F.R.S.E., a former President of the Royal College of Surgeons, Edinburgh. He was educated at Edinburgh Academy, obtaining his surgical qualification in 1883 and his dental three years later. He settled at Yealand Conyers, near Carnforth, where he became well known in the district. Always fond of a sea life, at the outbreak of the war he volunteered as surgeon on a transport, receiving a commission in August, 1915, when, after a few months on Salisbury Plain, he was appointed to the *Salta*. Captain Smith was a keen sportsman, shot, and angler, and loved an outdoor life. A medical friend writes of him as the best of companions and one who, owing to a wide experience gained by travelling in other countries, could give sound advice on many subjects.



M. R. HUGHES, M.B., B.S. MELB.,

CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain M. R. Hughes, who was killed in France on March 20th last, was 25 years of age. He matriculated from Wesley College, Melbourne, entering Queen's College at the Melbourne University, where he graduated in medicine and surgery with honours in 1915, and qualified for appointment as one of the resident medical staff of the Melbourne Hospital. At the completion of his term at this hospital he joined the Australian Imperial Force. After his arrival in England he was transferred to France as

medical officer to an Australian infantry battalion, and was serving in this capacity when he was killed. His death will be deeply regretted by a large circle of friends amongst the younger members of the profession in Victoria.

BENJAMIN DIGBY GIBSON, L., L.M., D.P.H. R.C.P.S. I.,

CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain B. D. Gibson, who died in Egypt on Jan. 14th whilst serving with the Anzac Mounted Division, was the only son of the late Henry Fisher Gibson, Deputy Registrar of the King's Bench, Dublin. He took his licentiateship in 1904 at the Royal Colleges of Surgeons and Physicians, Ireland, obtaining his Diploma in Public Health a few years later. He held various appointments, including that of house surgeon at the Royal City of Dublin Hospital and of resident medical officer at the Westmorland Hospital. Later he was assistant medical officer at the General Post Office and anæsthetist to the Dental Institute.



In 1914 he was in practice in the neighbourhood of Sydney, N.S.W., and on outbreak of hostilities was appointed to the Australian Army Medical Corps for home service, also acting as lecturer for the British Red Cross. A year later he was attached to a Light Horse Field Ambulance and was mentioned in the Katia-Romani despatch. He was subsequently transferred to another Light Horse Brigade and was recommended for honour by his commanding officer.

Captain Gibson was a freeman of Dublin and an active member of the Dublin Bay Sailing Club. He was unmarried.

GEOFFREY RATCLIFFE PLAISTER, M.R.C.S. ENG.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain G. R. Plaister, who was killed in action on April 11th at the age of 35, was younger son of Dr. W. H. Plaister, of Tottenham. He was educated at the London Hospital, taking his Conjoint qualification in 1905, when he settled in practice at Tottenham, becoming joint secretary to the North-East London Clinical Society. When war broke out he served at first as chief inspector to the local special constabulary, then obtaining a commission and becoming attached as medical officer to the Yorks and Lancaster Regiment. After being for some time the only officer in the regiment to come through unscathed he was killed almost instantaneously by a machine-gun bullet.



In an appreciation from the Tottenham Medical Union, Captain Plaister is described as a gentle and large-hearted personality, whose unassuming exterior concealed much worldly and medical wisdom. The union was formed on his suggestion to link the medical practitioners of the district in fraternal bonds. He will be specially missed by the poor of Tottenham, to whom he was a true friend.

JOSEPH NAYLOR, M.R.C.S. ENG.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant Naylor, who was one of the medical staff on H.M.H.S. *Salta*, and reported missing, supposed drowned when the vessel was mined in the Channel on April 10th, was the son of the late Mr. Joseph Naylor, J.P., sometime mayor of Kidderminster. He took his medical course at St. Bartholomew's Hospital, qualifying in 1889, and after holding an appointment as house surgeon at the Derbyshire General Dispensary he settled in practice at Tipton (Staffs), where he remained for 22 years.



In October, 1916, he volunteered for service at home or abroad, and after a period at Sunderland he was given embarkation and hospital-train duty. He was appointed to H.M.H.S. *Asturias*, and afterwards to the *Salta*.

THE UNITED STATES AND MEDICAL ORGANISATION FOR THE WAR.

The Supply of Medical Men and their Equipment.—The Medical Board of the Council of National Defence suggests the earlier graduation of senior classes in the medical schools of the country, the holding of continuous sessions, and the elimination of the year's hospital service heretofore required before entrance into the Navy or Army. The standardisation of all surgical instruments is advocated to ensure the exclusive production of the instruments needed by the combatant services and the elimination of all unessential types of instruments. Comparing these suggestions with the problem of keeping up the supply of medical men as presented to the authorities in England, the *Journal of the American Medical Association* says :—

> A medical school is, in a sense, a factory, the output of which is absolutely essential to the maintenance of the armed forces in the field. ..... The problem with us is quite clear. Medical schools and civil hospitals must be kept in operation. ..... The national emergency demands that they coöperate in overcoming the present grave shortage of medical men. This can be accomplished by reducing the teaching staff to a minimum, working through vacations to increase the product, or by the Italian plan, which meets the needs both of the service and the future at the same time.

The Italian plan, it is explained, is to send clinical faculties with attached medical students to base hospitals at the front, where army service is performed by caring for the sick and wounded, while instruction is continued at the same time. Men are thus graduated automatically into the medical corps of the Army during the progress of the war. Certain medical schools in America are already organising on these lines.

In the State of New York one thousand health officers are reported ready to make a preliminary examination of recruits. A mobile laboratory unit has also been organised to provide a diagnostic service at any point where needed for the mobilisation of the troops. The New York State Department of Health has ordered large supplies of vaccines, and a drinking water outfit is being worked out to provide calcium hypochlorite in sufficient quantity to disinfect 50 gallons of water, with means for removing the taste due to excess of chlorine.

Women Doctors and National Service.—In the *New York Medical Record* Dr. Mary S. Macy discusses the available means of organisation for national service among medical women in the United States. Of the estimated 145,240 persons qualified to practise medicine in the United States probably 5518, or nearly 4 per cent., are medical women. They are most strongly represented in the special departments, gynæcology claiming 519, obstetrics 143, pædiatrics 129, and ophthalmology (alone, or with ear, nose, and throat)

125. A large proportion are skilled in subjects which may be said to embrace the laboratory and social service fields of medicine (Dr. Macy computes it at 34 per cent.); they are versed in clinical pathology, roentgenology, public health, or bacteriology, which should make them specially useful if required for active service at the front. The remaining medical women, numbering 4500 or more, should, she thinks, be able to carry on the civilian medical work in their own communities, releasing men better equipped than themselves for military service.

Treatment of Tuberculous Soldiers.—Dr. Hermann M. Biggs, chairman of the Commission appointed by the National Association for the Study and Prevention of Tuberculosis, will have associated with him as members Dr. George M. Kober and Dr. Charles J. Hatfield. The chief work of this Commission will be directed towards the detection of incipient cases among the recruits in the Navy and Army and the prevention of the development and spread of the disease in the military forces and in the internment camps.

The Shortage of Salvarsan.—The Council of the St. Louis Medical Society have passed a resolution urging the Government to take prompt action "in view of the fact that an efficient arsenic product would be available in the market were it not for the present dangerous and unwarranted patent laws in regard to this and similar therapeutic products."

BLINDED SAILORS AND SOLDIERS.

Newington House Scheme.—At a recent conference at St. Dunstan's Hostel for Blinded Soldiers it was agreed that Newington House Hostel, Edinburgh, should be affiliated with St. Dunstan's while retaining control of its own affairs. All blinded Scottish sailors and soldiers who reside, or intend to reside, in Scotland will receive their training at Newington House. The official register of sailors and soldiers who have been blinded in the war will be kept at St. Dunstan's, and all recommendations with regard to additional allowances, bonuses, and other benefits will be received by the Pensions Ministry from St. Dunstan's only, but the authorities at Newington House will have a copy of this register, in so far as it relates to Scottish soldiers, submitted to them periodically.

Bazaar in Aid of St. Dunstan's Hostel.—On May 7th Queen Alexandra, who opened at the Albert Hall a bazaar organised in the interest of the work carried on at St. Dunstan's Hostel, thanked Sir Arthur Pearson for the work that he had done on behalf of the blind, adding that "nobody else could have accomplished it." Sir Arthur Pearson expressed the hope that the system of after-care which the bazaar was designed to benefit would smooth away the difficulties besetting the blind home-worker by providing him with raw material, supervising his work, marketing his goods, and assisting him in every way to overcome the handicap entailed by loss of sight. On succeeding days the bazaar was opened by Mrs. Lloyd George and the Lord Mayor of London.

RED CROSS THANKSGIVING.—On Thursday, May 17th, Ascension Day, the 3 o'clock service at Westminster Abbey will be devoted to thanksgiving for the beneficent work of the Red Cross. Application for tickets and all inquiries should be made to Mr. E. P. Vaughan-Morgan, Room 24, 83, Pall Mall, S.W.1. The north transept and nave of the Abbey will be open to the general public without tickets.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

To be temporary Surgeons: E. S. Bowes, S. S. Barton, J. S. McGrath, and D. S. Stevenson.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. H. W. Grattan to be temporary Colonel whilst employed as Assistant Director of Medical Services of a Division.

Lieut.-Col. Thomas H. J. C. Goodwin, C.M.G., D.S.O., to retain the acting rank of Colonel whilst employed as an Assistant Director of Medical Services at the War Office.

To be acting Lieutenant-Colonels: Temp. Capt. J. G. Johnston whilst commanding a Field Ambulance, Major N. Low, D.S.O., whilst commanding a Casualty Clearing Station.

Major A. W. Mayo Robson, C.V.O., C.B., R.A.M.C. (T.F.), to be temporary Lieutenant-Colonel.

The undermentioned are granted temporary rank whilst employed at the Sunderland War Hospital: As Lieutenant-Colonel: Lieut.-Col. J. W. Alexander, D.S.O., West Yorkshire Regiment (T.F.). As Majors: T. C. Squance, W. Robinson. As Captain: W. H. Maling.

To be temporary Majors: J. J. G. Blandford, Temp. Capt. L. B. Robertson, Canadian A.M.C., and Temp. Capt. J. F. Burgess, Canadian A.M.C.

Capt. C. W. Bowle relinquishes the acting rank of Lieutenant-Colonel on re-posting.

Temporary Lieutenants to be temporary Captains: R. L. Bell, W. R. H. Smith, G. A. Back, W. V. Pegler, H. W. Evans, H. Hendry, H. E. Whtttingham, J. Nunan, J. W. Tonks, L. R. F. P. Marshall, J. A. Fretton, G. E. Dodson, G. G. Old, H. Mohan, S. Macnaughton, S. C. W. Iredale, G. B. King, J. F. Nicholson, I. O'Keffe, D. Morrison, T. R. Hunter, W. Halliwell, J. A. H. Telfer, F. J. H. Begg, F. L. Keith, T. P. Hutchison, T. B. Brandon, V. Wallace, C. J. McCarthy, J. T. Blessdell, J. A. C. Roy, E. J. Dyke, H. B. Maxwell, S. Littlewood, W. B. Anderson, D. Ross, S. Robson, R. T. Taylor, A. E. Pinniger, W. Ward-Smith, J. P. Lowson, J. McF. Donnan, P. Milnes, R. A. Leembruggen, J. F. C. O'Meara, C. G. Skinner, A. M. Bayne, C. B. A. Frow, G. Stewart, L. B. W. Braine, E. C. A. Reynolds, R. A. McKay, J. E. O'Donnell, H. G. Joyce, J. C. Houston, C. W. Aikman, J. G. Ackland, W. R. White-Cooper, A. T. Edwards, A. C. Pickett, J. H. Lechler, F. E. Fellden, V. J. P. Clifford, W. S. Allan, W. H. W. C. Carden, S. H. L. Archer, C. Dundee, S. Pool, A. Beeley, A. H. Smith, C. Cameron, E. Hudson, A. A. Hill, A. D. Millington, J. V. Watson, A. C. Price, D. A. Chalmers, F. F. Carr-Harris, E. A. T. Green, L. L. McKeever, J. D. Wright, H. C. Davies, A. Ball, W. G. Shaw, G. J. McGorty, E. H. Shaw, L. Walton, T. D. Miller, R. C. B. Briscoe, F. R. Wilson, P. A. Rostant, J. Dickson, C. Harris, R. J. Arundel, J. P. Pegum, J. F. Penman, D. Corry, A. Wilson, A. Sunderland, K. M. Walker, J. F. Blackett, A. E. Gravelle, J. B. Wood, and G. E. Kinnersly.

Temp. Hon. Lieut. D. H. D. Cran to be temporary honorary Captain whilst serving with the Scottish Red Cross Society, and W. Martin to be temporary Honorary Captain while employed with the British Red Cross Hospital, Netley.

F. Packard to be temporary Honorary Lieutenant whilst serving with a General Hospital.

Officers relinquishing their commissions: Temp. Lieut.-Col. A. H. Burgess (Major, R.A.M.C., T.F.), having resigned his appointment; Temp. Lieut.-Col. F. D. Bird, C.B.; Temp. Capts. L. A. Walker, W. N. Rishworth, E. J. Eedle, F. L. Gill, W. T. Smith, W. A. Kennedy, H. R. Brown, J. L. Digby, C. Farrondge, W. P. Noall, J. N. Glaister, J. J. Crawford, A. H. Corley, A. D. Howard, R. Williams, C. A. Robinson, C. Butler, W. B. Lawrence, A. R. Rendle, W. J. Hill, J. W. Heekes, J. M. Twentyman, H. H. Clarke, H. M. Meyrick-Jones, A. P. Yonge, W. A. H. Birrell, D. T. Fraser, R. F. Jones (on account of ill-health), W. W. Scott, J. F. Steven, D.S.O. (on account of ill-health); Temp. Lieuts. J. E. Middlemiss (on account of ill-health), J. C. Buckley, D. R. Taylor, A. Whittome, E. Slack, H. B. Thomson, D. A. Crow, H. A. Macdonald, C. M. Eadie, W. F. Cornwall, F. J. MacManus, R. A. Slater, R. S. Novis, W. H. Soady, R. C. Corbett, W. W. W. Watt, J. E. Harford, J. G. Ross, A. E. Harrison, H. L. Morrow, J. R. Hall, P. J. Murray, J. E. C. Maguire, D. J. Jackson, W. Patey, W. A. Steen, M. F. Taylor, A. F. Seacombe, A. H. Arnott, and H. C. Terry.

SPECIAL RESERVE OF OFFICERS.

Capt. R. Magill relinquishes the rank of acting Lieutenant-Colonel on re-posting.

F. G. L. Dawson (from University of London Contingent O.T.C.) and T. H. Rhys to be Lieutenants.

TERRITORIAL FORCE.

Major C. A. Lees to be acting Lieutenant-Colonel whilst holding the appointment of Administrator.

Capts. J. S. Manford and A. T. Mulhall to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. (temp. Major) T. H. Peyton to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. A. Rodger, from T.F. Res., to be Captain, with precedence as from August 14th, 1915.

Capt. T. W. Morcom-Harneis to be acting Major whilst in command of a Field Ambulance.

Capt. A. G. T. Fisher to take rank and precedence in the R.A.M.C., T.F., and in the Army as if his appointment as Captain bore date the 10th day of July, 1916.

Capt. (acting Lieut.-Col.) A. J. Evans relinquishes his acting rank on ceasing to command a Field Ambulance.

Surg.-Maj. F. W. Bailey, D.S.O., from R.F.A., to be Major, with precedence as from Dec. 12th, 1915.

To be Captain: Lieut. J. Rosencwige, Lieut. W. C. D. Maile.

A. W. W. Baker to be temporary Captain whilst serving with the O.T.C.

Major A. H. Burgess is restored to the establishment.

H. C. Sands to be Lieutenant.

Capt. (acting Major) T. H. Chittenden relinquishes his commission on account of ill-health, and is granted the honorary rank of Lieutenant-Colonel.

VOLUNTEER FORCE.

Suffolk Volunteer Regiment, 5th Battalion: A. Leeming (late Lieutenant, R.A.M.C.) to be temporary Captain.

INDIAN MEDICAL SERVICE.

Lieut.-Col. A. Miller to be Professor of Medical Jurisprudence, Medical College, Madras, in addition to his other duties.

The King has approved the promotion of the following officers:—

Majors to be Lieutenant-Colonels: C. A. Lane, T. B. Kelly, C. H. Watson, E. F. E. Baines, G. O. F. Sealy, J. G. P. Murray, Brevet Lieut.-Col. S. Anderson, F. H. G. Hutchinson, J. L. Marjoribanks, A. Fenton, R. W. Knox, D.S.O.

Captains to be Majors: A. F. Hamilton, A. D. White, A. A. McNeight, N. M. Wilson, J. S. O'Neill, W. S. Nealor.

Lieutenants to be Captains: G. H. Mahony, G. Covell, W. R. Stewart, Kotyvenkata Ramna Rao, J. G. O. Moses, Hari Chand, Venkatasubba Mahadevan, A. C. L. O'S. Bilderbeck, J. W. Van-Reenen, B. F. Beatson, M. J. Roche, N. Das Puri, Prabodh Chandra Roy, Monmdranath Das, Jagannath Balkrishna Vaidya, J. M. R. Hennessy, A. G. Cowper, W. M. Lupton, H. H. Brown, C. H. N. Baker.

The King has also approved the grant of the temporary rank of Lieutenant to Noormahomed Kasembhai Chohan, and the relinquishment of temporary Lieutenant by Kaikhusro Kersaspji Dadachnji.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Venereal Disease Bill.

THE Venereal Disease Bill has been passed by a Standing Committee of the House of Commons, but its form has been greatly altered.

On Thursday, May 3rd, the Committee resumed the consideration of Clause 1, which provides for the prevention of the treatment of venereal disease or the supply of remedies therefor otherwise than by duly qualified persons. The first subsection had been disposed of at the previous sitting.

Mr. GLYN-JONES moved as an amendment the insertion of a new subsection in the following terms:—

No qualified medical practitioner shall supply to any patient any remedy for the treatment of a venereal disease except in areas in which for the time being a medical practitioner is permitted to supply drugs or medicines to insured persons under the National Insurance Acts or in cases where the practitioner himself administers the remedy to the patient. Provided that nothing in this subsection shall interfere with the supply of remedies by any institution or hospital approved by the Local Government Board for the treatment of venereal disease to patients attending such institution or hospital.

The honourable Member said that the effect of the Bill as it stood would be that medical men would be protected, not only in their proper function of diagnosing and prescribing for venereal diseases, but they would be able to take over the dispensing of medicines as far as they desired. The medical man would require the pharmacist to send his (the pharmacist's) customers to him. The separate functions of the medical man and the pharmacist were recognised at the time when the Insurance Act was passed. All that he asked the Committee to say was that the doctor should do his proper work and receive his proper fee, and that the pharmacist should supply the drugs, not on his own initiative but because they were prescribed by a medical man.

Sir P. MAGNUS, in opposing the amendment, failed to see any valid reason for altering the law as it now existed regarding the legal right of members of the medical profession to supply drugs in certain cases. The honourable Member talked about interfering with the rights of the chemist in supplying medicines. The Bill did nothing of the sort. All that it interfered with was the right to supply medicines for these specific diseases without a prescription. If he got the prescription he could supply the remedy. The amendment proposed to take away from the medical practitioner a right now given him by law. But the Committee had to look at this question from the wider point of view of public health and not from the pecuniary point of view of any profession. The Committee had to remember that persons suffering from these diseases were anxious that the fact should be known to as few as possible. The medical man was under a moral obligation not to allow what had been communicated to him as a medical man to be known, and in order to maintain the relation of confidence he should not be prevented from supplying the medicine to the patient.

Mr. HAYES FISHER (Parliamentary Secretary to the Local Government Board) said that the honourable Member (Mr. Glyn-Jones) was inviting the Committee to enter on the old battle, that doctors only should prescribe and chemists only should dispense. He hoped that the Committee would not be led aside by that. Medical men now had the power to dispense, and if the amendment was adopted it would be taken away from them so far as venereal diseases were concerned. He did not think that the Committee should do anything by this Bill to take that right away. He thought that medical men and chemists were both going to lose pecuniarily by the Bill and by the new policy of which it was a part, but the community would benefit. As the clinics for free treatment, of which the State bore 75 per cent. of the expenditure came into existence, and as people resorted to them, medical men would lose part of their private work. Chemists would lose something also, but he thought the medical men might lose more than the chemists. Just as the Sabbath was made for man and not man for the Sabbath, so doctors and chemists were made for the community and not the community for doctors and chemists. He thought the Committee should reject the amendment.

After some discussion the amendment was rejected by 22 votes to 8.

The Committee then proceeded to rearrange and redraft the remaining clauses of the Bill.

A second subsection was added to Clause 1 in the following terms:—

This section shall operate in any area to which it is applied by order of the Local Government Board or in Scotland and Ireland the Local Government Board for Scotland and Ireland respectively. Provided that no order shall be made in respect of any area until a scheme for the gratuitous treatment of persons in that area suffering from venereal disease has been approved by the Local Government Board or, in Scotland and Ireland, the Local Government Board for Scotland and Ireland respectively, and is already in operation.

Emphasis was placed by several members of the Committee on the desirability of having gratuitous treatment in operation before an order was made in regard to any area.

The other subsections of Clause 1 were cut out and the clause as amended was agreed to.

On the motion of Mr. GLYN-JONES, the following new clause was inserted in the Bill:—

A person shall not by any advertisement or any public notice or announcement offer to treat any person for venereal disease, or to prescribe any remedy therefor, or to give any advice in connexion with the treatment thereof.

A person shall not hold out or recommend to the public by any public notice or advertisement, or by any written or printed papers or handbills, or by any label or words written or printed affixed to or delivered with any packet, box, bottle, phial, or other enclosure containing the same, any pills, capsules, powders, lozenges, tinctures, potions, cordials, electuaries, plaisters, unguents, salves, ointments, drops, lotions, oils, spirits, medicated herbs and waters, chemical and officinal preparations, whatsoever to be used or applied externally or internally as medicines or medicaments for the prevention, cure, or relief of any venereal disease.

Provided that nothing in this section shall apply to any advertisement, notification, announcement, recommendation, or holding out made or published with the sanction of the Local Government Board, or to any publication sent only to duly qualified practitioners and/or to wholesale or retail chemists for the purposes of their business.

Another new clause was inserted in the Bill reproducing the terms of Subsection 3 of Clause I. of the original Bill in the following terms:—

If any person acts in contravention of any of the provisions of this Act he shall be liable on conviction on indictment to imprisonment, with or without hard labour, for a term not exceeding two years, or on summary conviction to a fine not exceeding one hundred pounds, or to imprisonment with or without hard labour for a term not exceeding six months.

A definition clause was agreed to as follows:—

In this Act the expression "venereal disease" means syphilis, gonorrhœa, or soft chancre.

The Bill as amended was ordered to be reported to the House.

Highlands and Islands Medical Service Board.

The report of this Board for the year 1916, now presented to Parliament and issued as a White Paper, shows that owing to war conditions the Board have not been able to give full effect to their various intentions. The needs of some of the more necessitous districts have been met as far as circumstances permitted, but in many districts no progress has been possible. The rest of the Board's schemes, and particularly those providing for capital expenditure, are practically in abeyance for the period of the war. The greater part of the work for which the Board was called into existence still remains to be done. Considerable progress has been made with the introduction of a medical service at modified fees to certain classes of the community, but the scheme is still incomplete, and the Board have not yet had sufficient experience of its working to enable them to determine whether, and, if so, to what extent, it may call for modification. For the present it applies to the crofter and cottar classes and their families and dependents, and others in like circumstances, to whom the payment of the practitioner's ordinary fee for medical attendance would be an undue burden. The fees chargeable to such persons will not exceed 5*s.* for the first visit and 2*s.* 6*d.* for each subsequent visit in the same illness. The maximum fee in midwifery cases has been fixed at £1. The estimated expenditure under the scheme for 1916, £20,000, has been exceeded by £500. The estimate for 1917 has been fixed at £22,000. A beginning only has been made with the organisation of nursing, but reference is made to the question of efficient nursing in connexion with maternity and child welfare schemes which, together with the Notification of Births (Extension) Act, 1915, and the Midwives (Scotland) Act, 1915, make necessary a unification of the nursing service if overlapping is to be avoided and economy in administration secured. The policy of the Board with regard to nursing in large areas is exemplified in the arrangements made for the Island of Lewis, the district committee being charged with the administration of both the last-mentioned Acts, while they also undertake the management of the general nursing service. It is provided that district nurses subsidised by the Board will be in the employment of the district committee, and their appointment and dismissal will be in the hands of the committee, subject to the approval of the Board. The report concludes with an expression of indebtedness to the Education Department of the Local Government Board for Scotland for permitting their officers to take part in the work of organising the Board's schemes, and to the Naval authorities for their kindness in arranging for the conveyance of doctors, nurses, and medical stores to and from outlying islands where the ordinary means of communication are at present in abeyance.

Billeting of Civilians and Infectious Disease.

As the result of representations during debates in the House of Commons on the Billeting of Civilians Bill a clause was introduced into the Bill to permit occupiers of premises in which persons were billeted under the measure to receive compensation for the loss or damage caused by the introduction of infectious disease.

HOUSE OF COMMONS.

WEDNESDAY, MAY 2ND.

Medical Classification in the Army.

Answering Mr. HOGGE, Mr. MACPHERSON (Under Secretary for War) said: It is not necessarily the existence of a disability but the degree of disability which determines a man's classification. Thus, varicose veins, if exceptionally severe, might lead to a man being rejected; if less severe, to his being placed in category C 3 or C 2, and so on. Their mere existence would not debar a man from being placed in category A. This might be quite unimportant. Each case must be judged by the medical man before whom the case comes on its own merits.

Medical Re-examinations.

Mr. G. LAMBERT asked the Under Secretary for War whether a man medically discharged from the Army and called up again under the recent Act had the right of appeal from the decision of the Army medical authorities.—Mr. MACPHERSON replied: A man called up and examined by a recruiting medical board under the Military Service (Review of Exceptions) Act, 1917, has no right of appeal against his medical classification by the board. Each man, however, to whom the notice requiring him to be medically examined is sent under the Act, has the right of application to a tribunal within 30 days from the sending of the notice for exemption from military service on any grounds set out in the Military Service Act, 1916, Section 2 (1), including the ground of ill-health or infirmity.

Mr. LAMBERT: Would a certificate from a man's own medical adviser be accepted?—Mr. MACPHERSON: I said in the course of the debate on the Act that due regard would be given to any certificate from a family practitioner.

Malarial Cases in the Army.

Mr. COWAN asked the Under Secretary for War whether the cases of malaria among officers and rank and file, now in England, were being generally treated by medical practitioners without special experience of that disease, which had resulted in a loss of man power to the Army by the prolongation of the treatment; and whether all malaria cases would now be put through a short but stringent course of treatment for the purpose of eradicating their infections immediately and allowing of their early return to duty.—Mr. MACPHERSON answered: Centres for the treatment of malaria have been established in each Command, and officers with experience of this disease have been placed in charge of them. Malarial cases are now being put through a course of treatment with the hope of eradicating the disease.

MONDAY, MAY 7TH.

Medical Men and Research Work.

Sir J. D. REES asked the Under Secretary for War whether, in calling up members of the medical profession, members whose research work was by common consent of public value would be included amongst the number of those who remained in the United Kingdom.—Mr. MACPHERSON replied: The decision as to the individuals to be called up has been delegated to the professional tribunals set up under the Military Service Act, and the point which my honourable friend has in mind will be for their consideration.

TUESDAY, MAY 8TH.

Medical Officers and Administrative Work.

Answering Major CHAPPLE, Mr. MACPHERSON (Under Secretary for War) said: The number of medical officers solely occupied with non-professional work in hospitals is negligible. The administrative duties are so bound up with professional knowledge and experience that no saving in medical officers would result from increasing the number of non-medical officers now employed.

Artificial Limbs.

In reply to Major CHAPPLE, who asked a question in regard to the supply of artificial limbs, Mr. BARNES (Minister of Pensions) said: To give satisfaction to the patient and to secure lasting qualities an artificial limb must be of the very best materials and workmanship and very carefully fitted to the person for whom it is made. I am advised that in these circumstances satisfactory limbs cannot be produced at so low a cost as £5, and I do not think that any advantage would be gained by bringing another department into the procedure of their supply.

Major CHAPPLE asked whether, in the case of a limbless officer, a sum of £25 is given him with which to buy an artificial limb; whether, in some cases at least, such an officer had had to pay £40; whether these limbs could be made for something over £5; and whether, in the interest of wounded soldiers as well as in the interest of economy, the right honourable gentleman intended to take any steps in the matter.—Mr. BARNES answered: It is not the case that a limbless officer is given a lump sum irrespective of the nature of the limb required. In Army Council Instruction No. 786 of 1916 a scale of prices is fixed for the various types of limb varying from £10 10*s.* for a Syme's amputation to £29 8*s.* for an ordinary leg with pelvic band and to £40 for an arm of a complex type for use in special cases, and the officer is given the price allowed by the scale for the type of limb required. No change is at present contemplated in this arrangement except such as may be occasioned by improvement of the type and by reduction in price due to competition.

Medical News.

A NEW wing of the Royal Naval Hospital at Haslar, the gift of the women of Canada, was formally opened by the Queen on Wednesday. Surgeon-General Sir A. W. May, Director-General of the Naval Medical Service, stated that £40,000 had been raised for the purpose, the hospital extension having taken the place of the hospital ship at first suggested, in order to give permanent expression to the Canadian women's generous gift.

MORTALITY AMONGST WOMEN IN CALCUTTA.—The excessive mortality amongst women and children in Calcutta is the subject of strong comment in the departmental report of the municipal health officer. The death-rate is 50 per cent. higher amongst women than amongst men, an evil, as the health officer points out, largely due to the observance of the purdah system in insanitary environments. This system, he suggests, would probably not be productive of much harm in garden houses with spacious compounds, but in the slums of a city it is fatal, involving the constant exposure of the women to insanitary surroundings, and creating grossly insanitary conditions. In a congested city it is difficult to secure privacy without sacrificing fresh air, the zenana is in consequence situated at the back of the house and inadequately lighted and ventilated. While the man who resides amid insanitary surroundings is usually away from home for the greater part of the day there is no such escape for the purdah woman. The terrible results are indicated by the fact that while the actual male death-rate in 1915 was 24·1 per 1000, the female rate was 37·8 per 1000.

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY, LIMITED.—The annual meeting of this society will be held on Wednesday next, May 16th, at 32, Craven-street, Strand, W.C. 2, at 4 P.M., when the annual report for the year 1916 will be presented. The report gives the gratifying information that the work for the year has been little affected by the war. The membership of the society has remained almost stationary, decrease in one class of cases being counterbalanced by increase in another. The income and expenditure account shows a balance carried forward of £1783 18*s.*

HOSPITAL AND HOME FOR SICK CHILDREN, LOWER SYDENHAM.—The annual report and statement of accounts for the year 1916 shows that this institution has suffered financially owing to the war. Largely owing to the increased cost of food a debt of £800 by way of loan has been incurred, to meet which stock must be realised at great sacrifice. The in-patient cases admitted during the year were 316, the out-patient attendances 3864 and the casualty cases 2411. Much good work was done in the eye and throat department, where children sent in by the London County Council are treated.

ASYLUM WORKERS' ASSOCIATION.—The annual general meeting of this association will be held at the Mansion House, London, on Monday next, May 14th, at 3 P.M., when the Lord Mayor, vice-president, will preside. The following, amongst others, are expected to take part in the proceedings: Sir John Jardine, President; Dr. David Nicolson, Sir William J. Collins, Sir James Crichton-Browne, Hon. Major Sir Robert Armstrong-Jones, Sir George H. Savage, Sir Frederick Needham, Dr. C. Hubert Bond, and Lieutenant-Colonel Thomson.

ROYAL EDINBURGH HOSPITAL FOR SICK CHILDREN.—At the annual meeting held on April 25th it was stated that while the price of food, coal, light, and medical dressings required in the hospital had gone up, the expenditure on the whole had gone down. The total surgical and medical attendances for the year numbered 26,842. On the medical side the work had been carried out by Dr. A. S. Cumming, Dr. R. Thin, and Dr. C. Mowbray Pearson. In the absence from the hospital on war duty of Mr. Stiles and Mr. Fraser, Mr. A. P. Mitchell had been in full charge of all surgical work.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

COLLIE, Sir JOHN, M.D., has been appointed a Physician to the Hospital for Epilepsy and Paralysis and other Diseases of the Nervous System, Maida Vale, W.

COMYN, HAROLD F., M.B., B.C.Cantab., M.R.C.S., L.R.C.P. Lond., Officer in Charge of Tuberculosis Department, Great Northern Central Hospital.

FORTY, DANIEL HERBERT, L.R.C.P. Lond., M.R.C.S., Medical Officer and Public Vaccinator for the Charfield District of the Thornbury (Gloucestershire) Union.

HANCOCK, J. B., M.R.C.S., L.R.C.P. Lond., Certifying Surgeon under the Factory and Workshop Acts for the Robertsbridge District of the County of Sussex.

MACKEOWN, W. J., M.B., B.S. R.U.I., Certifying Surgeon under the Factory and Workshop Acts for the Bishop's Waltham District of the County of Hants.

MEADEN, CHARLES, M.D., B.S. Durh., Acting Medical Officer for the Braunton District of the Barnstaple (Devon) Union.

RIVERS, CHARLES HENRY, Medical Officer of Health for the Redruth (Cornwall) Rural District.

TRAILL, A., Acting District Medical Officer for the Barnstaple (Devon) Board of Guardians.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

APPLECROSS, Ross-shire.—Medical Officer and Public Vaccinator. Salary £320 per annum.

BARNSLEY AND WAKEFIELD JOINT SANATORIUM COMMITTEE.—Resident Assistant Tuberculosis Officer and Resident Medical Officer at Mount Vernon Sanatorium. Salary £300 per annum, with board, &c.

BIRMINGHAM GENERAL DISPENSARY.—Resident Medical Officer, unmarried. Salary £300 per annum, with apartments, &c.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.—House Surgeon. Salary £150 per annum, with board, &c.

BOLTON INFIRMARY AND DISPENSARY.—Second House Surgeon. Salary £200 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURNLEY, VICTORIA HOSPITAL.—House Surgeon. Salary £160 per annum, with board, &c.

BURSLEM, HAYWOOD HOSPITAL.—Female Resident Medical Officer. Salary £200 per annum, with board, &c.

CARDIFF, KING EDWARD VII.'s HOSPITAL.—House Surgeon for six months. Salary at rate of £175 per annum, with board, &c.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—House Surgeon. Salary £200 per annum, with board, &c.

DERBY, DERBYSHIRE ROYAL INFIRMARY.—Two House Surgeons. Salary £200 per annum, with board, &c.

DERBYSHIRE COUNTY COUNCIL.—Temporary Medical Superintendent for County Sanatorium and Tuberculosis Officer. Salary £500 per annum.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

EVELINA HOSPITAL FOR CHILDREN, Southwark, S.E.—House Physician for four months. Salary at rate of £160 per annum, with board, &c.

GLOUCESTERSHIRE ROYAL INFIRMARY AND EYE INSTITUTION.—Senior House Surgeon. Salary £150 per annum, with board, &c.

HOLLAND (LINCOLNSHIRE) COUNTY COUNCIL.—Temporary County Medical Officer of Health and Temporary School Medical Officer. Salary £450 per annum.

HULL, VICTORIA HOSPITAL FOR SICK CHILDREN.—House Surgeon.

IPSWICH, EAST SUFFOLK AND IPSWICH HOSPITAL.—Two Female Resident Officers.

ITALIAN HOSPITAL, Queen-square, London, W.C. 1.—House Surgeon for six months. Salary £80 per annum, with board, &c.

KENSINGTON BOARD OF GUARDIANS.—Resident Assistant Medical Officer Locum Tenens for Marloes-road Institution. Salary 7 guineas per week, with board, &c.

LEEDS PUBLIC DISPENSARY.—Resident Medical Officer. Salary £200 per annum, with board, &c.

LINCOLN, CITY OF.—Temporary Assistant Medical Officer of Health. Salary at rate of £300 per annum.

MANCHESTER, HULME DISPENSARY, Dale-street, Stretford-road.—House Surgeon. Salary £250 per annum, with apartments, &c.

NOTTINGHAM CHILDREN'S HOSPITAL.—Female House Surgeon. Salary at rate of £200 per annum, with board, &c.

PAISLEY PAROCHIAL HOSPITAL, LUNATIC WARDS, AND POORHOUSE, Craw-road.—Resident House Surgeon. Salary £260 per annum, with board, &c.

PLAISTOW FEVER HOSPITAL, London, E.—Temporary Female Resident Medical Officer. Salary at rate of £300 per annum, all found.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.—Casualty Officer.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Election of Professors and Lecturers.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Senior Resident Medical Officer. Salary £200 per annum. Also House Physician. Salary £50 per annum, with board, &c.

ST. GEORGE'S HOSPITAL, S.W. 1.—Temporary Assistant Surgeon for six months.

ST. HELENS COUNTY BOROUGH.—Temporary Assistant Medical Officer of Health. Salary £350 per annum.

ST. PETER'S HOSPITAL FOR STONE, &c., Henrietta-street, Covent Garden, W.C.—Senior and Junior House Surgeons for six months. Salaries at rate of £75 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SURREY EDUCATION COMMITTEE.—Temporary School Dentist. Salary £300 per annum.

UNIVERSITY COLLEGE HOSPITAL.—Casualty Surgical Officer. Salary £100 per annum, with lunch. Also Assistant in Dermatological Department and Part-time Assistant in Venereal Diseases Department. Salary £200 per annum, with lunch.

WARWICKSHIRE AND COVENTRY JOINT COMMITTEE FOR TUBERCULOSIS.—Temporary Tuberculosis Officer. Salary £500 per annum.

WELLS ASYLUM, Somerset.—Temporary Assistant Medical Officer. Salary £300 per annum, with board, &c.

WORCESTERSHIRE, KING EDWARD VII. MEMORIAL SANATORIUM, Knightwick, near Worcester.—Temporary Medical Superintendent and Tuberculosis Officer. Salary £450 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Grosmont (Yorks) and at Tipton (Stafford).

Births, Marriages, and Deaths.

BIRTHS.

BATTY SHAW.—On May 6th, Muriel, wife of Dr. Batty Shaw, F.R.C.P., of a daughter.

BELL.—On May 1st, at Knaresborough-place, S.W., the wife of Major F. C. Bell, C.A.M.C., of a son.

HILTON.—On May 6th, at The Corner House, Northwood, the wife of O. Hilton, M.D., of a daughter.

MAWHOOD.—On May 4th, at Chalcots, Ascot, the wife of R. H. Mawhood, M.B., B.C. Cantab., F.R.C.S. Eng., of a son.

VERCOE.—On April 29th, at Old Court, Ealing, the wife of Richard H. Vercoe, M.R.C.S., L.R.C.P., of Southall, of a daughter.

MARRIAGES.

CROSS—WEAVER.—On April 23rd, quietly, in London, Leopold Harold Cross, L.D.S. Eng., Captain, R.A.M.C., to Clarice Blanche, daughter of the late John Weaver and Mrs. Weaver, of Streatham.

DRAKE-BROCKMAN—PILKINGTON.—On May 7th, at St. Botolph's Church, West Worthing, Lieutenant-Colonel Ralph H. Drake-Brockman, R.A.M.C., to Helen Maud, second daughter of Major Sir H. Pilkington, K.C.B., R.E. (retired), and Lady Pilkington, of Studland House, Worthing.

GRAY—COOPER.—On April 26th, at St. John's, Red Lion-square, Archibald Montague Henry Gray, M.D., Major, R.A.M.C., T.F., of 30, New Cavendish-street, W., only son of the late Dr. F. A. Gray, of Ottery St. Mary, Devon, to Elsie, youngest daughter of the late F. B. Cooper, of Newcastle, Staffs.

PICKLES—TUNSTILL.—On May 5th, at St. Andrew's Church, Aysgarth, Yorkshire, by the Rev. W. K. Wyley, M.A., vicar of the parish, Surgeon William Norman Pickles, M.B., M.S. Lond., R.N.V.R., son of Dr. J. J. Pickles, of Leeds, to Gertrude Adelaide, daughter of Harry Tunstill, of Thornton Lodge, Aysgarth, and of Rivington, Pendleton, Manchester.

DEATHS.

ADENEY.—On May 2nd, at Haward Lodge, Tunbridge Wells, Edwin Leonard Adeney, M.D., J.P., aged 58 years.

COALBANK.—On Saturday, May 5th, at Teddington Lodge, Teddington, Isaac Coalbank, M.R.C.S. Eng., L.S.A., M.D. Paris, aged 73 years.

DOUDNEY.—On April 29th, at Kombe, Northern Nigeria, of malaria, Dr. Leslie Doudney, W.A.M.S., aged 38 years.

FOWKE.—On April 27th, at Byfield, Northamptonshire, Frederick William Fowke, M.R.C.S. Eng., M.R.C.P. Edin., L.S.A. Lond., aged 73 years.

FOX.—Missing, believed drowned, on April 15th, Lieutenant-Colonel A. C. Fox, D.S.O., R.A.M.C.

KERR.—On April 26th, in San Francisco, William Watt Kerr, M.D. Edin., aged 59 years.

LONES.—Killed in action, on April 28th, Captain Percy East Lones, R.A.M.C., aged 30 years.

NASON.—On April 29th, at "Arbury," Stratford-on-Avon, John James Nason, M.B., J.P., aged 84 years.

SQUIRE.—On May 2nd, at his residence, Bentinck-terrace, North-gate, Regent's Park, N.W., after three days' illness, John Edward Squire, C.B., M.D., F.R.C.P., aged 61 years.

SYMONS.—Killed in action, on April 30th, Lieutenant-Colonel (acting Colonel) Frank A. Symons, C.M.G., D.S.O., Assistant Director of Medical Service.

TACKABERRY.—On March 25th, at a Stationary Hospital abroad, Captain John Bailey Tackaberry, I.M.S., aged 34 years.

TURNER.—On May 2nd, at Clifton, George Browne Turner, M.D., J.P., of Camden House, Hemel Hempstead, in his 91st year.

WILLIAMS.—Died May 4th, 1917, at Gullsborough, Northants, Henry William Williams, M.D., aged 81, eldest son of the late William Williams, surgeon, of Gullsborough, Northants.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE following promotions and appointments to the Order of the Hospital of St. John of Jerusalem in England have been made: Major Sir Edward Scott Worthington, C.M.G., M.V.O., and Lieutenant-Colonel Frank Warburton Begbie, R.A.M.C., to be Knights of Grace, and Surgeon Lieutenant-Colonel James Stuart Brooke, V.D., to be an Esquire.

Notes, Short Comments, and Answers to Correspondents.

MICROSCOPIC STAINING WITH COPYING-INK PENCIL.

AT a recent meeting of the Zurich Medical Society, Dr. Louis E. Merian called attention to the convenience of using coloured pencils in staining microscopical preparations. The idea was suggested to him by a paper of Dr. E. Friedberger in the Military Supplement of the *Münch. med. Wochenschr.* of Nov. 21st last. Friedberger has invented a universal pencil for staining pus and blood films as well as gonococci, trypanosomes, spirochætes, and malaria parasites, and he proposes to bring out a Giemsa and a carbol-fuchsin pencil after the war. The method of staining suggested was very simple. After fixing, a drop or two of water was placed on the slide, and the coloured pencil rubbed in the water until the required depth of colour was attained. The preparation was then rinsed and dried in the usual way. It occurred to Dr. Merian that the ordinary indelible pencil obtainable for 1*d.* (they now cost 4*d.*) might serve the same purpose. The result proved satisfactory for white and red blood corpuscles, gonococci, and spirochætes. Of the various makes of indelible pencil obtainable in Switzerland Dr. Merian found "A. W. Faber Radium 5800" the most suitable, while Faber's "Castell," Hardmuth's "Mephisto 73 B. middle," and Rehbach's "Defregger" were also good. Dr. Merian claims a special handiness and cleanliness for this method as well as the convenience of carrying the pencil anywhere in the pocket. The stain keeps indefinitely and does not deteriorate as stains do in solution.

We have used this method in emergency, finding it to work well for pus, blood, and cultures. The drop of water should be placed by the side of the film, the indelible pencil rubbed well into it, and the coloured drop then led over the preparation.

THE SPARROW.

IT is officially explained that the sparrow whose destruction the Board of Agriculture urged is the house-sparrow, not the hedge-sparrow, "which is an eminently useful bird, to be encouraged by all possible means."

Some useful information with reference to this bird will be found in a small book published in 1899 by Vinton and Co., entitled "The House Sparrow: The Avian Rat," by William Bernhard Tegetmeier, F.Z.S., with an appendix by Eleanor A. Ormerod, F.E.S., of the University of Edinburgh. In his preface Mr. Tegetmeier said:—

> It is a remarkable fact that there is not one eminent, practical ornithologist of the present day in England or elsewhere who advocates the protection of this species. Many of those in the very first rank of science, and with the greatest experience of country life and knowledge of practical ornithology, who advocated the claims of this bird to protection in their youth, have, as the result of further experience and careful observation, been led to denounce it.

The tree-sparrow (*Passer montanus*) is smaller than the house-sparrow (*Passer domesticus*) and has a black patch in the middle of the white feathers on each side of the neck. There are also two distinct bands of white across the wing in place of one as in the ordinary sparrow. The so-called hedge-sparrow, or Dunnock (*Accentor modularis*), is wrongly named, says Mr. Tegetmeier:—

> It is a purely insect-eating bird, and neither in its structure, habits or food, is it closely related to the house-sparrow. It does not occur in large numbers and is highly beneficial as an insect destroyer.

An American report of 400 pages by the eminent ornithologist, Dr. C. H. Merriam, related the destruction effected by the sparrow in the United States. Particulars of wicker, wire, and other sparrow traps are given. In some parts of the country an arrangement of four ordinary bricks with short pieces of stick is used.

The food of sparrows for May to August is given as follows:—

> May.—Customary food: Corn; vegetable matter; seeds. Occasional food: Young pea-pods and leaves of peas; gooseberry blossoms and young gooseberries; small beetles; caterpillars of the brimstone moth and white cabbage butterflies; turnip seed; hay seed; sprouts of young barley half an inch long; pollen of the sycamore and apple; mangold leaves.
>
> June.—Customary food: Corn; vegetable matter; seeds of various sorts; peas. Occasional food: Gooseberries and other fruit; lettuces; small beetles; mangold leaves.
>
> July.—Customary food: Young wheat, barley, and oats; vegetable matter; seeds of various weeds. Occasional food: Peas; small beetles; beans; seeds of wild spinach.
>
> August.—Customary food: Wheat, barley, oats. Occasional food: Seeds of corn, bindweed, knotgrass, &c.; aphides, small beetles, daddy longlegs (*Tipula*), caterpillars of *Teras Contaminana*, moth of *Crambus culmellus*.

It is well known that sparrows when taken in large numbers may be advantageously utilised as food.

A METHOD OF PRESERVING EGGS.

M. André, of Arnoux, recently described before a Paris medical society a practical means of preserving eggs for several weeks, allowing of their safe transport to the troops and to prisoners. The method consists in covering the egg with a hard envelope which prevents the penetration of the air. The new-laid egg is wrapped round with material steeped in liquid sodium silicate, so-called mineral glue, and then left to dry in an airy place for about twelve hours. At the end of this time the jacketed egg is of the consistency of a stone and entirely resistant to shock. When required for consumption it suffices to steep the egg in tepid water in which the mineral glue readily dissolves, or the silicated envelope may be cut off with a knife in the same way as fruit is peeled. 520 eggs which travelled for a month under the most exacting conditions arrived intact and in an excellent state of preservation.

HEALTH AND SANITATION IN NIGERIA.

FROM the medical section of the delayed report of Sir F. D. Lugard, Governor-General, on the Blue-book of Nigeria for the year 1915, just issued by the Colonial Office, it appears that the native population of the Northern Provinces is roughly estimated at 9,500,000 and that of the Southern Provinces at 7,805,000—a total of about 17,500,000. The average density in the Northern Provinces is about 37 to the square mile and in the Southern Provinces about 105. In the Northern Provinces at the end of 1915 there were about 700 Europeans, of whom some 300 were officials, and in the Southern Provinces about 2000 Europeans, of whom 800 were officials.

The general health of the colony was normal during the year. Compulsory registration of births and deaths only obtains in Lagos and Ebute Metta, and even in these places statistics are unreliable. The most prevalent general diseases are rheumatism and anæmia. Malaria is the commonest insect-borne disease, but small outbreaks of yellow fever have occurred on four occasions at different places in the Southern Provinces amongst the native population only, and one European contracted this disease in the Northern Provinces. A mild form of sleeping sickness is endemic in certain parts of the Niger Delta; the same disease is also found along the banks of the River Benue. Blackwater fever has shown a steady decline since 1910—this follows very closely the malarial fever curve. Considering the largely increased European population the decline of malaria and blackwater fever is significant. Cases of pulmonary tuberculosis were observed more frequently than in former years. Although confined for the most part to the humid Southern Provinces, a few cases have also been seen amongst the natives in the drier Northern Provinces. In the opinion of the medical and sanitary officers this disease is on the increase, and often assumes a very virulent form. There were no cases of beri-beri seen in the prisons during the year. Among the natives of the Cross River the disease is not unknown.

The returns do not in any way represent the true incidence of venereal diseases in the community. Syphilis and gonorrhœa are common diseases all over Nigeria except in the pagan districts of the north, where the natives are reputed not to intermarry with those of other tribes. Helminthic infections are so prevalent that it would be difficult to find a native who does not harbour one at least of the three most common parasites. The percentage of the population infected with ankylostomiasis is very high—probably over 80 per cent. in certain areas—but the infection seldom produces clinical symptoms. It is believed to be often associated with severe cases of diarrhœa and dysentery.

The limitations which the advent of war had imposed upon sanitary activity in the course of the second half of 1914 remained throughout the whole of 1915. Under the circumstances the Northern Provinces should be accounted fortunate, as visitations of epidemic diseases were few. The most unfortunate sanitary legacy bequeathed by 1915 was the fact that it had become necessary to recognise enteric fever and tuberculosis as naturalised members of the community of endemic diseases. A European, a member of the medical staff, succumbed to the former. An improved water-supply has been provided for Lagos. Considerable attention was given during the year to the important question of segregation of the European population at many of the leading political and commercial centres. Definite areas were arranged and, although immediate results cannot be obtained in all instances, progress is gradually being made as opportunity arises and means become available.

In the Northern Provinces the principal hospitals and dispensaries are at Zungeru, Lokoja, Kaduna, and Kano. 812 Europeans and 15,887 natives were treated as out-patients and 325 Europeans and 4364 natives as in-patients; 14 Europeans and 200 natives died. In the Southern Provinces the chief hospitals and dispensaries are at Lagos, Warri, Calabar, Ibadan, and Onitsha. In

these there were treated during the year 411 Europeans and 76,872 natives as out-patients and 1656 Europeans and 9309 natives as in-patients; 12 Europeans and 760 natives died. The Leper Asylum at Yaba and the leper settlements at Ibusa, Onitsha, Okhanam, and Illah had 20, 133, 49, 65, and 32 inmates respectively during the year.

THE CULTIVATION OF JALAP.

To the Editor of THE LANCET.

SIR,—Among the herbs recommended for growing in England I should like to know if jalap has ever been tried. I first saw it in a Norfolk garden, and I now grow it as a creeper at my Hampshire cottage. It bears a beautiful convolvulus flower in the autumn. It produces a few tubercles each year, but I have no knowledge of their medicinal value.—I am, Sir, yours faithfully,

Devonshire-place, W., May 8th, 1917. GEO. H. SAVAGE.

*** The dried tubercles of jalap (*Ipomœa purga*) yield about 10 per cent. of official resin, containing jalapin and scammonin.—ED. L.

A LOST STETHOSCOPE.

To the Editor of THE LANCET.

SIR,—The other day a patient of mine was walking on Crow Lane, which is situated between Newton-le-Willows and Earlestown, when a rapidly-driven motor passed him, from which dropped an object that he brought to me.

It is a stethoscope made of nickel-plated material with the chest- and ear-pieces of pure tortoise-shell. I should say it was of more than ordinary value and should be pleased to forward it to any medical man who may have lost one answering to that description in this locality.

I am, Sir, yours faithfully,

M. C. S. LAWRANCE.

100, Market-street, Earlestown, Lancs., May 8th, 1917.

TWILIGHT SLEEP.

A CORRESPONDENT suggests that we should comment upon the advertisement methods of a nursing home where this treatment is in use, but it seems to us that the public will see at a glance what impression is intended to be produced.

Jupiter.—The administrative orders have recently been so frequently altered that reference to your Local Medical War Committee is the only course to be safely recommended.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, May 9th, 1917.

Date.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Tem.	Wet Bulb.	Dry Bulb.	Remarks.
May 3	...	109	68	48	50	56	Fine
,, 4	...	113	74	48	53	58	Fine
,, 5	...	101	72	50	52	56	Cloudy
,, 6	...	96	65	40	39	45	Fine
,, 7	...	105	63	38	48	51	Fine
,, 8	...	103	64	40	45	50	Fine
,, 9	...	101	62	40	46	50	Fine

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

BOOKS, ETC., RECEIVED.

BRITISH ESPERANTO ASSOCIATION, 17, Hart-street, Bloomsbury, W.C.
Caroline Stephen's Fundamentoj de la Kvakerismo Esperantigita de Montagu C. Butler el la kvara eldono de la originalo. 1*s.* 9*d*

CASSELL AND CO., London.
A Handbook of Midwifery for Midwives, Maternity Nurses, and Obstetric Dressers. Fourth edition. By Comyns Berkeley, M.A., M.D., M.C. Cantab., F.R.C.P. Lond., M.R.C.S. Eng. 6*s.* net.
Notes on Military Orthopædics. By Colonel Robert Jones, C.B., Inspector of Military Orthopædics, A.M.S. With Introductory Note by Surgeon-General Sir Alfred Keogh, G.C.B., Director-General, A.M.S. 2*s.* 6*d.* net.

CHURCHILL, J. AND A., London.
Pulmonary Tuberculosis: its Diagnosis, Prevention, and Treatment. By W. M. Crofton, M.D. 6*s.* net.
Psychological Medicine: a Manual on Mental Diseases for Practitioners and Students. By Maurice Craig, M.A., M.D. Cantab., F.R.C.P. Lond. Third edition. 15*s.* net.

PUTNAM'S (G. P.) SONS, London and New York.
Hygiene in Mexico: A Study of Sanitary and Educational Problems. By Alberto J. Pani, C.E. Translated by Ernest L. de Gogorza.

The following journals, magazines, &c. have been received:—La Chirurgia degli Organi di Movmento, Annales al la Facultad de Medicina Montevideo, American Medicine, British Journal of Dermatology and Syphilis, Practitioner, Birmingham Medical Review, Annali d'Igiene, Archives of Internal Medicine, Pediatrics, British Journal of Ophthalmology, Transactions of the Society of Tropical Medicine and Hygiene, West London Medical Journal, British Journal of Dental Science, Annales de l'Institut Pasteur, British Dental Journal.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.
THURSDAY.—Bakerian Lecture:—Mr. J. H. Jeans: The Configuration of Astronomical Masses and the Figure of the Earth.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, May 15th.

GENERAL MEETING OF FELLOWS, at 5 P.M.
Ballot for Election to the Fellowship.

MEETINGS OF SECTIONS.

Tuesday, May 15th.

PSYCHIATRY (Hon. Secretaries—Bernard Hart, G. F. Barham): at 6 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.

Wednesday, May 16th.

HISTORY OF MEDICINE (Hon. Secretaries—J. D. Rolleston, Charles Singer): at 5 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.

Thursday, May 17th.

DERMATOLOGY (Hon. Secretaries—J. E. R. McDonagh, Henry MacCormac): at 5 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.
Cases will be shown at 4.30 P.M.

Friday, May 18th.

OTOLOGY (Hon. Secretaries—E. D. D. Davis, Somerville Hastings): at 5 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.
Cases and Specimens (at 4 P.M.):
Dr. Dan McKenzie and Dr. Robert Knox: The Anatomy of the Fallopian Canal.
Mr. J. F. O'Malley: The Escape of Cerebro-spinal Fluid from the Ear for Twelve Months.
Mr. W. H. Jewell: A Case of Unusual Tinnitus.
Discussion:
On "The Relation of Diseases of the Ear to Recruiting for the Army and Navy" will be opened by Capt. G. J. Jenkins.

ELECTRO-THERAPEUTICS (Hon. Secretaries—E. P. Cumberbatch, R. Knox): at 8.30 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.
Paper:
Dr. Mottram and Mr. Sidney Russ: A Contribution to the Study of Dosage in Radium Therapy.

MEDICAL SOCIETY OF LONDON, 11, Chandos-st., Cavendish-sq., W.
MONDAY.—8 P.M., General Meeting. Election of Officers for 1917-18 Session and to receive Annual Report. 9 P.M., Annual Oration:—Sir William Osler: The Anti-Venereal Campaign.

LONDON DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY.—4.30 P.M., Clinical Meeting. Cases sent for Consultation. Demonstration of Pathological Specimens. Clinical Cases will be shown by Dr. H. C. Samuel, Dr. B. Winston, Capt. W. Griffith, R.A.M.C., Dr. B. James, Dr. W. K. Sibley, Dr. J. B. Ridley, and Dr. M. Dockrell.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.
WEDNESDAY.—4.30 P.M., Paper:—Sir C. Arthur Pearson: The Blind Sufferers from the War and their Future Employment.

SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
FRIDAY.—5.30 P.M., Paper:—Read for Dr. H. R. Carter (Washington, U.S.A.): Spontaneous Disappearance of Yellow Fever from Failure of the Human Host.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.
THURSDAY.—3 P.M., Prof. W. Bateson: The Chromosome Theory of Heredity and the Alternatives. (Lecture I.)

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.
Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—
WEDNESDAY.—4 P.M., Lecture V.:—Right Hon. Lord D'Abernon: Public Health and the Control of the Liquor Traffic. Followed by a discussion.

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It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

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Goulstonian Lectures
ON
PARATYPHOID INFECTIONS.

Delivered before the Royal College of Physicians of London.

BY CHARLES HEWITT MILLER,
M.D. CAMB., F.R.C.P. LOND.,
ASSISTANT PHYSICIAN, LONDON HOSPITAL; PHYSICIAN, VICTORIA HOSPITAL FOR CHILDREN; LATE MAJOR (TEMP.), R.A.M.C.

LECTURE I.

MR. PRESIDENT AND GENTLEMEN,—I wish first to offer my thanks to the College for the honour done me in selecting me to give these lectures. I am anxious also to ask for your indulgence as the difficulties of preparing the lectures in war time have been very great.

INTRODUCTORY.

I have taken paratyphoid infections as my subject as it is one of very great interest in the medical history of the war and it promises to be of continued importance to this and other countries after the war has ended. At this period it might be objected that the time has not yet come for the consideration of a subject of this nature; for the observations and reports that are being made are not available for reference. The subject, therefore, is not yet ready for final consideration. This is especially true of the bacteriological investigations, but clinical observations can always be recorded and reviewed. At this juncture a clinical study of paratyphoid infections is not out of place, for a great change has come over the clinical character of these diseases, and descriptions made in the first two years of the war will differ materially from those of the third and subsequent years.

The bacteriology and serology of these diseases are complicated, and the literature on the subject is becoming extensive. I do not propose to deal with the bacteriologist's side of the subject at all fully. But in these, as in all infections, the need is illustrated for close coöperation between the wards and the laboratory; for it is essential that both the bacteriologist and the physician should be able to regard the subject from the point of view of the other. In this respect I have been fortunate in being associated with Major H. L. Tidy, R.A.M.C., for whose help and coöperation I am very grateful.

The bacteriological aspect of these diseases is necessarily of great importance, for the making of an absolute diagnosis rests with the bacteriologist. Further, he alone can say when a patient is free from infection. The clinician, on the other hand, has to make the first diagnosis; but he cannot go further than diagnose the "enteric" group;[1] it is impossible for him to diagnose typhoid fever from paratyphoid fever and the paratyphoid fevers from each other. Several points of diagnostic difference have been recorded, but they do not hold good, for though there may be a tendency for one organism of the group to produce a certain set of conditions more frequently than the others, instances of similar conditions produced by the other organisms can usually be found. It does not follow that a description of typhoid fever would be applicable to the paratyphoid fevers. The organisms of the latter diseases have apparently a wider range of infection in the human body, and in addition to the "enteric" symptoms may cause some systemic disease or group of symptoms that will mask the nature of the infection.

HISTORICAL SUMMARY.

It will be my endeavour to give a description of these infections as I have seen them and as they have been recorded by other observers. But, first, it will be convenient to give a brief historical summary of the paratyphoid organisms and how they were found to be associated with disease.

In 1896 Achard and Bensaude[2] gave an account of a case of apparent enteric fever in whose urine they found a bacillus which was not *Bacillus typhosus*. They called it paratyphoid.

In 1893 Norman Gwyn[3] described a case of enteric fever caused by an organism with which the agglutination tests for typhoid were negative all through the illness.

In 1900 Harvey Cushing[4] described an organism obtained from the pus of a costo-chondral abscess following an attack of apparent typhoid fever. This organism was not *Bacillus typhosus*.

In August, 1900, and again in 1901, Schottmüller[5] described bacilli which presented characteristics between *Bacillus typhosus* and *B. coli*, which did not give the agglutination reactions for *B. typhosus*.

In 1901 Durham,[6] in discussing agglutinin gave a classification of organisms of typhoid-like and colon-like morphology, among which the paratyphoid organisms would find places.

In 1902 Buxton,[7] in working on these and allied organisms, split the paratyphoids into two groups, α and β; α is nearer *B. typhosus*, β is nearer *paracolon*.

In 1904 Firth[8] gave a comprehensive account of paratyphoid A among British troops in India. Since then important contributions to our knowledge have been made by officers of the Royal Army Medical Corps, especially by Birt, Statham, Harvey, Grattan, and Wood, their observations being chiefly on our troops in India.

In 1912 Bainbridge[9] gave the Milroy lectures on Paratyphoid Fever and Meat Poisoning. Employing the absorption methods as described by himself, Castellani, and Boycott, he was able to put on a definite basis the differences between paratyphoids A and B and the organisms of meat poisoning, *B. suipestifer* and *B. enteritidis* of Gaertner.

INCIDENCE BEFORE AND DURING THE WAR.

Before the war occasional cases of enteric fever were seen in which the agglutination test was repeatedly negative. On making further examination with a culture of *B. paratyphosus B* a positive result was sometimes obtained. Such an occurrence is within the experience of most physicians.

Boycott[10] has calculated that each year in London 100 cases of clinically enteric fever might be expected to be paratyphoid B fever, and that in England 3 per cent. of the cases which run the clinical course of enteric fever are really paratyphoid fever. They also form a fraction of enteric cases in statistics that have been compiled in Germany and America.

In India it has been calculated that in addition to the cases of enteric fever caused by *B. paratyphosus A* a large number of the cases called "pyrexia of uncertain origin" are really paratyphoid A.

Paratyphoid fever in Europe is more frequently B than A; in India A is common and B very rare. If paratyphoid A fever has occurred in England before 1914, it must have been very rare, though it has been seen in France, in Germany, and in America.

Since the outbreak of war opportunities for the study of paratyphoid infections have increased enormously. At first paratyphoid B fever was very rife in Belgium and Northern France; later paratyphoid A infections occurred. With the Gallipoli campaign the number of paratyphoid cases was greatly increased, the paratyphoid B cases being more numerous in the early autumn and A cases in the late autumn.

The cases of paratyphoid fever which have come under my observation have been patients at the British Red Cross Hospital, Netley. At this hospital patients have been received from every front. Comparatively few were admitted with the diagnosis of enteric fever. The majority were wounded or sick men, who started their symptoms of enteric fever a few days before or after admission. Men who had been buried, or gassed, or who had trench feet or wounds of the chest seemed particularly liable to contract the infection. In all 500 cases of paratyphoid infections have been in the hospital between October, 1914, and February, 1917, and there have been opportunities for seeing the cases in all stages and through all stages. Many of these patients have been double, and even triple, infections of the enteric group. Some have been mixed infections with bacillary and amœbic dysentery. The majority of the multiple infections came from Gallipoli.

[1] The term "enteric" will be used to denote the typhoid and paratyphoid fevers. Typhoid fever will be used for infection by *B. typhosus*, and paratyphoid fever for infection by *B. paratyphosus A* and *B*.

[2] Achard et Bensaude: Bull. et Mém. Soc. Méd. des Hôp. de Paris, 1896, xiii., 3 S.

[3] N. Gwyn: Johns Hopkins Bulletin, 1898.

[4] H. Cushing: Ibid., 1900.

[5] Schottmüller: Deutsch. med. Wochenschrift, 1900; Zeits. f. Hyg. und Infektionskrankheit., Leipzig, 1901.

[6] H. E. Durham: Journal of Experimental Medicine, 1901, vol. v., No. 4.

[7] Buxton: Journal of Medical Research, 1902, vol. viii.

[8] Journal of the R.A.M.C., 1904-1910.

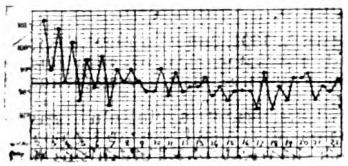
[9] THE LANCET, March, 1912.

[10] Quoted by Bainbridge, loc. cit.

CLINICAL TYPES OF PARATYPHOID INFECTIONS.

The majority of observers do not go further than to say that paratyphoid fever closely resembles mild typhoid fever, or is typhoid fever on a small scale. Firth[11] says that paratyphoid infections may be mild or as severe as in genuine typhoid. This statement is confirmed by the cases seen during the war, for all degrees of severity have been seen varying from an apyrexial type to the severest form of enteric fever. Certainly the cases of paratyphoid fever seen in the first two years of the war were more severe than the cases of typhoid fever among the inoculated. The features of the classical description of typhoid fever are very commonly seen in paratyphoid fever—i.e., headache, diarrhœa, the type of temperature, the roseola, the enlarged spleen. But these symptoms and signs may be present in a patient whose condition has a resemblance to some other disease—e.g., influenza, rheumatism, and nephritis.

CHART 1.



Mild case of paratyphoid B. Short duration. T. steady after third week. Sudden onset, shivering, headache, malaise. T. 103·2°, P. 76. Tongue clean, constipation; spleen palpable on ninth day; no spots. Stools = para. B.

As in typhoid fever, the paratyphoid organisms produce a bacillæmia, and it is therefore possible for any part or parts of the body to be infected or affected. The paratyphoid organisms have not the same limited affinity for the lymphatic tissue of the intestine as the *Bacillus typhosus* but tend to produce lesions in various parts of the body. The effects on the different anatomical structures of the body may be summarised thus:

1. Respiratory system: Rhinitis; pharyngitis; laryngitis; tracheitis and bronchitis; broncho-pneumonia and pneumonia; pleurisy, dry, serous, sero-fibrinous, purulent.

2. Alimentary system: Gastritis; enteritis, with and without ulceration of the lymphatic tissue; colitis, ditto; appendicitis; inflammation of bile-ducts, gall-bladder, and liver.

3. Urinary system: Nephritis; pyelitis and pyonephrosis; cystitis.

4. Skeletal system: Osteitis; synovitis, arthritis, and peri-arthritis; myositis (?), myalgia.

5. Vascular system: Phlebitis; arteritis; possibly endo-, myo-, and pericarditis; septicæmia.

In addition, inflammation of the middle ear, iris, conjunctiva, meninges, testicle, and epididymis have been seen.

Many of these anatomical lesions are more properly considered as complications, and for clinical purposes other forms of classification are more suitable. Dr. E. Stolkind,[12] of Moscow, speaking at the Royal Society of Medicine, gave the following classification: (1) the influenzal or respiratory form; (2) the gastro-intestinal form; (3) the choleraic form; (4) the typhoid form. This classification indicates that in Dr. Stolkind's opinion paratyphoid infections may be of a varied nature. He also said that clinically and pathologically there is no difference between paratyphoid A and B. He laid special stress on the frequency of the respiratory or influenzal type.

In collecting the particulars of the cases that came under my observation I found that there was a great variety of clinical types among the cases. The initial stages of the disease frequently resembled other diseases, but later on there would be a closer resemblance to enteric fever. It is convenient to classify them under certain headings for the purposes of description, but I wish it to be understood that the typhoid type is to be regarded as the parent type and the others as the offspring.

The headings under which I propose to classify paratyphoid infections are: (1) the typhoid; (2) the dysenteric; (3) the biliary—i.e., jaundice and cholecystitis; (4) the urinary—i.e., nephritis, cystitis, &c.; (5) the rheumatic or arthritic; (6) the respiratory—i.e., bronchitis, pneumonia, and pleurisy; (7) the influenzal; (8) the septicæmic.

I. THE TYPHOID TYPE.

The typhoid type is the one most commonly seen and recognised, at any rate among the uninoculated.

General Description.

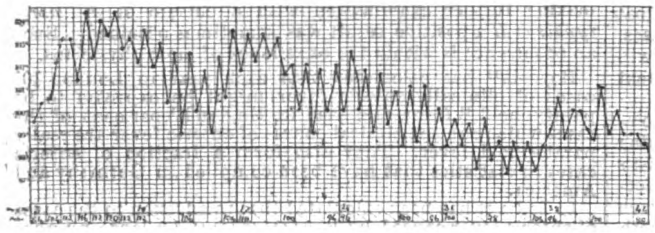
The period of *incubation* is difficult to calculate. The patient is usually unable to give any information, for the possibilities of infection on any one day are the same as on any other. Also, the patient may have been an unaffected carrier for some time, and it only required some circumstance to lower the resistance and so cause symptoms to develop. But judging from such information as was available the incubation period is from 12 to 20 days.

The *onset* is either gradual or sudden. The gradual onset is rather more frequent than the sudden. In the gradual onset the more common symptoms are general slackness, increasing headache, loss of appetite, thirst, pains in the back and legs, dizziness, inability to keep warm, and insomnia. In the sudden onset shivering, fainting, and vomiting are of frequent occurrence. Sometimes sudden intense headache is the first symptom.

Abdominal pain is common; it is usually moderately severe and colicky, and is not localised. *Diarrhœa* occurs in more than half the cases; it is usually of short duration and is followed by weeks of constipation. *Nose-bleeding* occurs in about one-sixth of the cases.

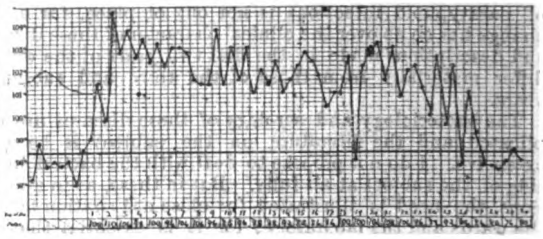
There is usually a noisy *cough* and a red, swollen throat; at first there is very scanty sputum. Less commonly there are deafness and blindness and photophobia.

CHART 2 A.



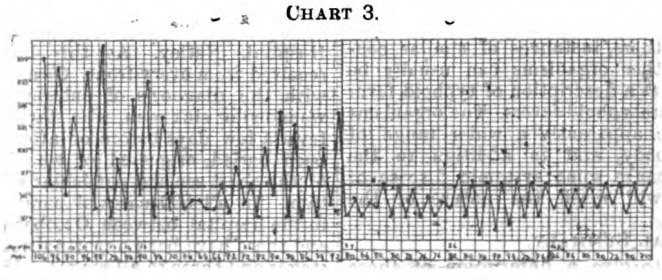
Severe case of paratyphoid A, enteric type. October, 1915, jaundice followed by debility. Jan. 17th, 1916: Three days' illness; pain in stomach, headache, diarrhœa; Feb. 12th: T. rising; Feb. 17th: T. 104·4°, delirium, spleen +, spots, constipation. Agglutination + para. A. Urine = para. A. Stools = *B. coli*.

CHART 2 B.



Enteric fever, paratyphoid B. Severe case of classical typhoid type. Sharp initial rise and defervescence. Patient not inoculated. Agglutination + para. B. Copious rash, spleen +, diarrhœa, delirium. Trench feet.

CHART 3.



Irregular type with remissions of 3° and 4°. Also period of swing, fifth week, before finally settling. On admission debility, constipation, T. rising seven days. Tongue dry, white fur, abdominal distension, spleen +, spots, delirium. Para. A in stools, agglutination negative. Inoculated (2) seven months ago.

[11] Firth: Journal of R.A.M.C., 1904, ii.
[12] Proceedings R. Soc. Medicine (Med. Sect.), Nov. 23rd, 1915.

The *aspect* of the patient is not often alarming. The cheeks and ears are flushed, the pupils moderately wide, and the skin dry. But in severe cases the patient has the same appearance as in severe cases of true typhoid, and in some cases, especially those in which the lungs are affected early, there may be profuse sweats.

The patient is drowsy and apathetic; he can be easily roused; the memory especially for the details of the onset of symptoms is poor. He is content to lie curled up in bed and only wishes to be kept warm and left undisturbed. If asked, he will probably complain only of headache or backache. The headache is most often vertical, but may be frontal or occipital.

The *tongue* varies greatly in different individuals. Generally speaking, the tongue is more frequently moist than in true typhoid. It is commonly pale, with yellowish-white fur on each side of the middle line. The edges and tip are red and moist. The impressions of the teeth are very noticeable. In other cases the tongue is dry, covered with a brown crust, and is cracked. In the severest cases the tongue is tremulous and is put out with uncontrollable shaking jerks. The condition of tongue need not bear any relation to the temperature. I have seen a dry brown tongue with a temperature of 99° F., and a moist clean one with a temperature of 104°.

Temperature and Pulse.

The *temperature* is very varied.

1. The case may be apyrexial except for an occasional evening rise to 99° or 100°. In these cases there may have been a very short febrile period before the patient came under observation. This condition is also seen after defervescence following an acute attack, especially if it has been mild.

2. The period of pyrexia may be very short. This is more often seen when the original rise is sudden but not high. (Chart 1.)

3. The temperature may be of the classical typhoid type, with the initial rise either gradual or abrupt, and remissions beginning about the tenth to fifteenth days. (Charts 2 A and 2 B.)

4. The remissions in the temperature may be very pronounced all through the pyrexial period; this type is also often associated with sweating. (Chart 3.)

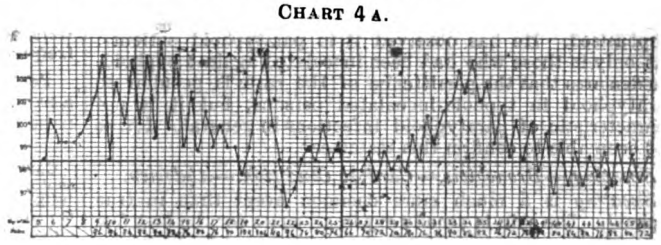
5. The pyrexial period may be prolonged by recrudescence. (Chart 4A and 4B.)

6. The temperature may be of an irregular type; it may resemble the temperature of a hectic consumptive; it may be of an inverted character, with morning rises and evening falls. Briefly, it may be of such a type that it cannot be classified. This is the largest group of all, for few of these cases resemble each other as regards pyrexia. It does not seem possible to lay down rules with regard to the temperature either with regard to rise, maintenance, or defervescence. But it frequently happens that if the temperature reaches its highest point quickly, the duration of fever is shorter than in other cases where the rise has been by gradual steps.

The *pulse* behaves in a more orderly fashion than the temperature and is of importance in diagnosis both for its own characteristics and its relationship with the temperature. The pulse is soft, easily compressed, often dicrotic and relatively slow. Slowness of the pulse with a rising temperature is the most important of the early signs of paratyphoid fever. It is even more constant and more pronounced than in typhoid fever. Thus a pulse of 76 with a temperature of 101° F., or 82 with 102°, or 90 with 103°, are seen quite frequently in favourable cases. Above 103° there is commonly a "loosing" of the pulse, and it may quicken to 120 with a temperature of 104°. It may often be noticed that if the pulse is rapid in the early days of the fever the temperature may go high, and the patient is probably in for a severe attack with pronounced nervous symptoms. The pulse, therefore, has a prognostic as well as a diagnostic value. As the temperature comes down the pulse becomes slower and slower and may go down to under 50. As convalescence proceeds it gradually comes back to normal.

Carles and Marcland[13] have made an exhaustive study of the pulse in paratyphoid fever and have come to similar conclusions. They have described the relationship between pulse and temperature graphically by curves. They describe four types.

CHART 4 A.



Case 2, H. H. Enteric fever, paratyphoid B. Remittent T., relapse of classical typhoid type. Perforation 20th day; operation. Relapse 30th–40th days.

1. The commonest or angular form; the temperature curve falls obliquely, while the pulse curve remains horizontal and at normal the two curves meet.

2 and 3. Parallelism, distant and absolute. In the former the curves approach, but do not meet, at normal; in the latter the curves remain apart.

4. The inverted angular type, only seen in very grave cases; the curves cross each other—i.e., the pulse increases in rapidity out of ratio with the temperature.

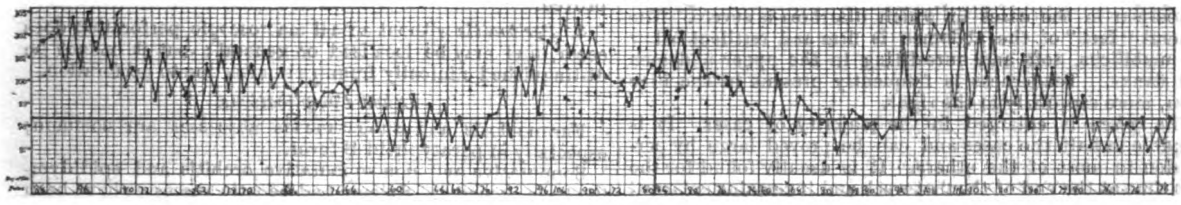
Such elaborate and artificial methods are not for everyday use, but it is demonstrated that if the pulse is slow in relation to the temperature a definite diagnostic point is gained, and if, with the symptoms pointing to enteric fever, a relatively rapid pulse is found the prognosis is serious.

The arterial tension is low. J. D. Rolleston[14] has shown that in typhoid fever the tension is low in 93 per cent., and that the lowering is in direct relation to the severity of the illness. The same is found in the paratyphoid fevers; the low tension, 90 to 100 mm. Hg, is found to persist for the first week or two of convalescence.

The Rash.

The rash appears for the first time about the end of the first week. It is of different varieties.

CHART 4 B.



Enteric fever, double paratyphoid infection. Prolonged T. with recurrent exacerbations and relapse. On admission diagnosis of hysteria, shock, and debility. Para. A and B in stools; agglutination + A and B. At first nervous symptoms pronounced, later typical enteric. Relapse (not shown) after 36 days normal T.; T. 103·6°, P. 128. Later periostitis of tibia.

1. The commonest variety is the roseola which is seen in true typhoid. The spots appear on the lower part of the chest and the abdomen. Subsequent crops are of frequent occurrence, and fresh crops may be seen in convalescence without there being any exacerbation of symptoms or a rise of temperature.

2. The second variety of rash may be regarded as characteristic of paratyphoid fever. It consists of larger spots, of irregular outline, red with a blue tinge, raised, not fading completely on pressure, and leaving a freckle-like mark of pigmentation after they have disappeared.

3. The third variety is rare. Cyanotic subcuticular patches of irregular shapes and sizes are sometimes seen in severe cases. These patches may be the only evidence of a rash, or they may be mixed with the other forms.

[13] Archives des Malad. du Cœur, Année ix., No. 3, 1916.
[14] J. D. Rolleston: Medical Press and Circular, March, 1916.

The amount of rash may vary from one or two spots to a general covering of trunk, limbs, and head. The diagnosis of measles or rubella is sometimes made in these cases of generalised eruption. In the cases of morbilliform rash that I have seen the large dusky paratyphoid spots have been very numerous.

CASE 1.—J. D., admitted from France for frost-bite. On the fifth day after admission the temperature began to rise, and in 48 hours was 104·6° F. He was very ill. There were delirium, diarrhœa, a palpable spleen, pulse of 110. On the sixth day spots began to appear, and in two days he was covered from head to foot with spots of the larger variety and also a few small pink spots. On the twenty-eighth day the temperature was normal; the spots had disappeared leaving a brown stain. No previous inoculation. Agglutination +++ to *B. paratyphosus B*

Labbé [15] says that the persistence of spots for some days after the cessation of fever is a point which has been emphasised. He has observed it in paratyphoid patients, but only in those who had been inoculated against typhoid. He declares that the persistence of the rash is peculiar to paratyphoid in typhoid-inoculated persons, but it is not characteristic of paratyphoid infections in general. I have not been able to confirm this statement.

Sweating.—Bronchitis.—Cardiac Condition.—Abdomen.

Sweating is a much more common event than in true typhoid. The skin is usually dry in all cases for the first few days, but in some cases sweating is profuse and begins early. It is so severe that sometimes the question of malaria has to be considered. When the illness begins with shivering and a rise of temperature which is followed by a profuse sweat the similarity is great. But as the temperature does not come down with the sweating the resemblance ceases to be close. The sweating at night is a great nuisance to the patient, as it necessitates frequent changes of clothing and spoils his chances of sleep.

Bronchitis occurs with great frequency during the first ten days. It is of short duration, and the cough is distinct from the initial cough which is due to the condition of the throat. Basal crepitations are also common about the eighth day, when the temperature is 103° F. or higher. In the milder cases the bases remain clear. The more serious bronchial and pulmonary conditions will be described later.

The heart.—Cardiac inflammations are rare. I have not seen a case of pericarditis nor of endocarditis, but they have been recorded. Myocarditis has been diagnosed by some observers, but this statement must be accepted with reserve. Two conditions of the heart are worthy of note.

1. A diminution of the area of cardiac dullness associated with a shortening and a lessening of the intensity of the first sound. This phenomenon is not perceptible until the fever has lasted at least a week.

2. Cardiac dilatation occurs in a few cases, but it is usually late in the course of the illness.

The abdomen.—A moderate degree of distension is almost always present. There may be distension to the degree of meteorism in the cases in which diarrhœa is severe. The general "feel" of the abdomen is firm and resilient below the umbilicus, soft and unresisting in the upper abdomen and flanks. Tenderness is frequently present in the iliac fossa, more especially in the right.

The *spleen* is enlarged in the majority of cases. It is palpable in half the cases and can be proved large by percussion in most of the others. It is usually found for the first time at the end of the first week and it remains enlarged during convalescence. Further, the spleen is very often painful. Pain in the left hypochondrium is a frequent symptom of the early days, and the pain may last a long time. It is stabbing in character and is made worse by deep inspiration and coughing. It sometimes raises the suspicion of left-sided pleurisy, for the pain is like that of an inflamed serous membrane.

The *liver* edge is occasionally lower than normal, and deep tenderness over the area of the gall-bladder is fairly common. Sometimes it is of short duration; at other times it is recurrent and accompanied by spasms of colicky pain.

The stools.—In nearly all cases there is an initial diarrhœa, the stools being of liquid fæcal matter. In a few cases the diarrhœa persists and there may be 8 or 10 actions in the 24 hours. In such cases the stools may be of the "pea-soup" variety. But most commonly diarrhœa only lasts two or three days and is followed by constipation.

Intestinal Complications.

1. *Hæmorrhage* occurs as in typhoid fever, but is not so frequent.

[15] Labbé: Med. Press and Circular, 1915.

At the highest estimate it is not more than 5 per cent. Labbé mentions it as occurring in 2 cases out of 45; Torrens and Whittington [16] report cases of severe hæmorrhage occurring in paratyphoid B; Dawson and Whittington [17] report it as a cause of death in 2 cases and with toxæmia in 3 more. I have seen it in 2 cases only, and in neither case was it severe. An occasional streak of blood or small clot is very common.

2. *Perforation* is rare, but symptoms that cause perforation to be suspected are more common.

It was found in 3 autopsies out of 17 [17]; of these, 2 were paratyphoid B and 1 was A. In another series [16] there were 3 perforations due to paratyphoid B and 1 to A. Moorhead mentions 1 case of perforation in which there was a mixed infection by paratyphoid B and *Entamœba histolytica*. Other writers [18] mention it as occurring in paratyphoid B as frequently as in typhoid fever.

Perforation occurred in two of my cases, one of which was a paratyphoid B infection, the other a mixed infection by paratyphoid A and B and *B. dysenteriæ* (Shiga). The following case is of interest:—

CASE 2.—H. H., admitted from Mediterranean, 3.1.16, for chronic septic focus on left arm; inoculated twice against typhoid, August, 1915. History: Headache for four days; abdominal pain; constipated. On admission, T. normal; rose to 100·2° F. next morning, and gradually climbed to 103°, and after swinging with remissions of 3° came to normal on Jan. 17th. (Chart 4 A.) Tongue brown and dry; spleen palpable; abdomen distended during febrile period.

Jan. 18th: 5 A.M.: Acute abdominal pain in right iliac fossa; vomiting. 7.30 A.M.: Right lower abdomen rigid and tender; little movement; tongue dirty; T. 101·4°, P. 100. 10.45 A.M.: Right side of abdomen acutely tender; T. 102·2°, P. 100. Aspect suggests peritonitis. 11.30 A.M.: More comfortable; very little tenderness; looks much better. My surgical colleague, Major C. Nitch, R.A.M.C., saw him and decided to wait. (Up to this point the course had been similar to that of another patient who had been quite well again in two days). 2 P.M.: More tender again. 4 P.M.: Further vomiting. 7 P.M.: Operation by Major Nitch. Incision below umbilicus; bile stained fluid everywhere; intestines red, rough, and covered with lymph; small perforation discovered in ileum 8 inches from ileo-cæcal valve; suture; recovery.

Jan. 28th: Typical relapse lasting 10 days. Ultimately a good recovery. Agglutination positive to *B. paratyphosus B*; organism recovered from stools.

3. *Appendicitis.*—Typical symptoms and signs of inflammation of the appendix are fairly common.

The case quoted above resembled appendicitis in many respects. But actual inflammation and ulceration of the appendix do occur for they have been found post mortem, [19] and I have seen two acutely inflamed appendices removed during the acute stage of paratyphoid B fever. Stolkind also mentions appendicitis paratyphosa. Rathery and his colleagues [20] mention appendicitis occurring in the course of, or convalescence after, paratyphoid B fever. In their experience it is a mild condition; they have not seen a case of gangrene nor perforation of the appendix. The frequence of appendicular symptoms is apparently a peculiarity of paratyphoid B. I have not seen a case of appendicitis due to paratyphoid A, but I have seen mild cases that were not proved.

4. *Peritonitis* without actual macroscopic perforation does occur, and may be localised or general; but it cannot be distinguished clinically from peritonitis due to perforation.

Other Complications.

Furunculosis and subcutaneous abscesses are common, especially in paratyphoid B fever.

Suppurative and non-suppurative orchitis and epididymitis have occurred. Splenic and hepatic abscesses have been discovered post mortem. An abscess of the brain in paratyphoid B fever has been reported by Scott and Johnston. [21] Osteitis, periostitis, and abscesses of bones, especially of the ribs and tibiæ, have occurred among my cases and are reported by others.

Arterial complications are rare. Thrombosis has been found in different arteries, most frequently in arteries of small size. Macadam [22] has described a case in which thrombosis was found extending from the left internal carotid artery, through the middle meningeal to the lenticulo-optic and lenticulo-striate branches. The infection was paratyphoid B. Phlebitis will be considered as belonging to the stage of convalescence.

Relapses occur in different percentages according to different observers.

[16] Torrens and Whittington: Brit. Med. Jour., 1915.
[17] Dawson and Whittington: Quart. Jour. Med., ix., No. 34.
[18] Les Fièvres Paratyphoïdes B, Rathery and others, 1916.
[19] Dawson and Whittington: Loc. cit.
[20] Rathery: Loc. cit.
[21] Scott and Johnston: THE LANCET, 1915, i., 852.
[22] Macadam: Journal of R.A.M.C., xxvii. (No. 4), 499.

Wiltshire[23] reports 7 in 98 cases; Labbé[24] quotes a similar proportion, 3 in 45; Robinson[25] says that relapses of brief duration are not uncommon. On the other hand, Dawson[26] says that re-infections are uncommon.

In my cases the percentage is about 8, and in quite a fair number those who relapse have more than one relapse. The relapses become milder as time goes on. In one case there was a relapse after five weeks of normal temperature; in another case there were 5 relapses, each one being milder than the previous one.

Kennedy and Russell[27] have reported a case of paratyphoid A fever with relapses on the thirty-fifth, fifty-eighth, and ninety-fifth days, during which the organism was isolated from the blood.

There were more relapses in the patients who came from Gallipoli than in those who came from France. It is possible that the greater prevalence of double infections in the former could account for the greater frequency of relapses among them.

Convalescence.

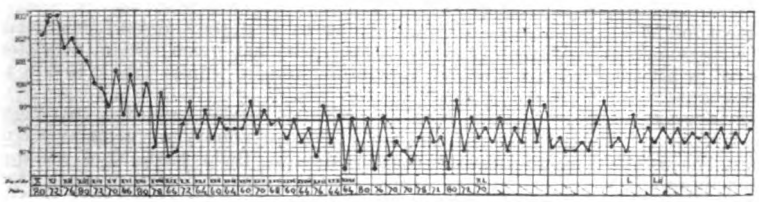
The behaviour of these patients, when the acute stage is over and they are well enough to be up and about, is very disappointing. Their progress is slow; their normal vigour does not return; they constantly say that they feel weak and good for nothing. Lassitude, morning headache, lack of appetite, inability to sleep in the early part of the night and waking up unrefreshed, are frequent complaints. This is a very different picture from the convalescence of typhoid fever.

How much these complaints are due to paratyphoid and how much to the circumstances of active service it is impossible to say. In a base hospital in this country patients remain until they are well, and their condition following the termination of an acute illness can be studied. These men are still infected and they are suffering from an infection the virulence of which is on the wane. The infection may not be capable of demonstration at each examination of excreta. But repeated examination will often reveal the presence of a paratyphoid organism. This does not mean that these patients will ultimately become chronic carriers, but they have not yet thrown off their infection. It is too early yet to say what percentage of infected men will become carriers.

Temperature.—Commonly there is an occasional evening rise to 99° or even 100° F. during convalescence, but the arresting feature of the temperature chart is the amount of "swing." A difference of 1½° and even more between the morning and evening temperature is quite common; the swing gradually lessens as time goes on. Putting the patient back to bed and allowing him only a fever diet does not affect the temperature, and in my opinion it is a mistake to do so. (Charts 5 A and 5 B.)

The *circulatory system* is also in an unsatisfactory condition. The area of cardiac dullness, which has shrunk during the febrile period, may gradually return to normal in a patient making satisfactory progress and taking exercise. But in many others it is common to find a heart that is dilated with a widely diffused impulse and a displaced apex beat. The action is rapid and the heart races on exertion or excitement. The patient complains of cardiac pain and palpitation. A few days in bed, limitation of food and tobacco, and attention to the stomach and bowels will improve the condition. In some of these patients there are tremors of fingers and copious axillary sweating. In this class of patient the heart-rate is not increased in sleep. In others the condition is more obstinate, and these patients go to form a portion of the men who are invalided for "soldier's heart," unless their hearts will respond to education by graduated exercise. Many of these conditions, "irritable heart," "D.A.H.," &c., originate from some infective disease, and the paratyphoid infections are certainly capable of producing these conditions.

CHART 5 A.

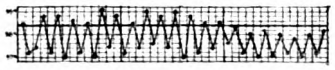


Irregular type of T. Prolonged irregular T. for four weeks after defervescence. Enteric fever, paratyphoid B. Patient inoculated for typhoid (2) January, 1915. Headache, diarrhœa, spots, dry furred tongue, spleen +. Agglutination 12th day +++ typh. and para. B. Stools = para. B.

The peripheral circulation is bad. Cold, blue hands and feet are very common. This will occur in men who have never suffered from cold extremities before. Polyuria accompanies this condition. In two cases polyuria has been so excessive that they were sent into hospital as diabetes insipidus. One patient was passing over 25 pints a day. In each case there was a history of diarrhœa of short duration, and polyuria began a few weeks later. In each case *B. paratyphosus B* was found in the stools. Vigorous exercise up to the point of sweating was found to be the best treatment for these conditions.

Phlebitis and thrombosis of veins occurred in 5 per cent. of my cases. The veins affected were either the internal saphenous vein, or the small subcutaneous branches of the internal saphenous vein on the calf, or the femoral vein. In one patient who had thrombosis of veins in both legs, phlebitis of the median basilic vein of the right arm occurred. The average incidence of thrombosis would seem to be about 4 per cent. Moorhead had 3 cases; Torrens and Whittington had 3 cases in 100 paratyphoid B and 1 in 50 paratyphoid A. Wiltshire noticed it in 4 paratyphoid B cases in a series of 97. Rathery says that phlebitis is relatively frequent. It certainly seems to be commoner than in typhoid fever.

CHART 5 B.



Prolonged period of swing in paratyphoid A, before settling. Chart shows 11th, 12th, and 13th weeks after acute illness.

[In examining the legs of men whose shins were painful I was struck by the frequency with which a hard, rigid, internal saphenous vein was found at the point where it passed in front of the internal malleolus. It felt like a tendon and could be traced a little way up the leg and felt as a cord going deep into the muscles of the calf. The internal saphenous vein over the calf was usually soft and its contents fluid; occasionally it was thrombosed. But the vein over the internal malleolus was rod-like and solid. It was found that in the enteric wards this condition was absent in only 5 per cent. of cases. In the ordinary medical wards it was absent in 70 per cent., and in surgical wards it was absent in 80 per cent. In some of the cases in which it was present in the medical wards an enteric infection had been suspected but not proved, and in one of the surgical cases *B. typhosus* was isolated from the stools. These veins were also present in some cases where there had been extensive flesh wounds of the thigh, and in two patients in whom the femoral vein had been tied. This phenomenon may turn out to be quite valueless as a diagnostic indication of a previous enteric infection, but it is possibly a sign of a deep thrombosis; its prevalence in the enteric wards is suggestive.]

Constipation in convalescence is frequently troublesome, but a regulation of diet and plenty of exercise will usually overcome it. In other cases liquid paraffin by itself or with cascara may be necessary at first.

Symptoms of *neurasthenia*, apart from the neurasthenic cardiac condition already mentioned, are only too evident during convalescence. Again, whether active service or paratyphoid fever is more to blame is a difficult question to answer. In my experience the neurasthenic state is more common in paratyphoid convalescents than in other cases. Further, the victims of shell-shock, gassing, and burying are especially liable to contract paratyphoid fever, and in their convalescence suffer severely from their nervous symptoms. Insomnia and night-terrors are particularly common among paratyphoid convalescents.

Nervous disturbances of a more definite type have been observed. Three cases of spasmodic asthma occurred in men who had never had asthma before. Severe paroxysmal headache was present in several patients. One patient, whose headache was occipital, suffered so severely that he threatened to do away with himself. Melancholia was seen in one man who had had only a mild attack of paratyphoid B. In all these cases the symptoms were transitory, and in six months' time the patients were fit.

[23] Wiltshire: Practitioner, xcvi., 91.
[24] Labbé: Loc. cit.
[25] Robinson: THE LANCET, 1915, ii., 851.
[26] Dawson: Proc. R. Soc. Med., 1915, ix., Med. Sect., p. 5.
[27] Kennedy and Russell: Brit. Med. Jour., April 29th, 1916.

TRENCH SHIN AN INFECTIOUS FIBROSITIS.

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UNDER the heading of infectious fibrositis I propose to discuss a condition with a fairly definite symptom-complex, of which the outstanding symptoms are pain and tenderness on pressure over the tibiæ and tibiales antici.

During practically the whole of the time the British Army has been in France and Flanders, also in Greece, cases of this description have been continually observed. Owing to the frequency of involvement of the shin bones, and the fact that the disease is very common amongst soldiers in the trenches, it is usually called "trench shin." Cases occur, however, in men who have never been in the trenches, indicating that this term cannot be regarded as universally applicable. I suggest that the term "infectious fibrositis" be used to designate this and kindred affections, believing as we do that these diseases are of infectious origin, and that the bacteria or their toxins, causing the morbid condition, show marked elective action for fibrous tissue. They attack the fibrous structures of periosteum, ligament, muscle, nerves, and other parts which are rendered vulnerable by cold and wet, or by any disturbance which interferes with the blood-supply to the part, such as the wearing of puttees. The evidence in favour of this view will be given later in this paper under the heading of "Etiology."

Symptoms.

In addition to the outstanding symptoms which have already been mentioned—namely, pain and tenderness in the lower limbs, many others may be present, but most of them are not constant. Fever is practically always present in the early stage of the condition, and is generally rather high when the patient first comes under observation, usually about 102° F., but sometimes as high as 103° or more. In the great majority of cases it disappears within a few days, but there may be variations in this respect, as we shall see when we come to report illustrative cases of the disease. In one of the cases recorded in this paper fever of a low grade lasted for 20 days, but such persistence is, judging from our own experience, rather exceptional. The pyrexia is invariably accompanied by a polymorphonuclear leucocytosis. The association of fever and leucocytosis with the general clinical manifestations of the disease has led us to the assumption that it is of infectious origin. An interesting feature of the blood count is the presence of leucocytosis after the fever has disappeared. In one of our own cases a leucocytosis of 15,500 was still present eight weeks after the disappearance of fever. The pulse-rate nearly always remains below 100, but varies to a certain extent according to the temperature.

Headache is the rule in the early stage of the disease, and is described by some of the patients as being "jumping" or "stabbing" in character and worse at night. The temples and forehead are the most common sites of pain, and the patients frequently state that the headache is intensified by rapid movement of the eyes or pressure on the eyeballs. It is also aggravated by coughing, and is not infrequently accompanied by dizziness. In a few of the cases reported the headache has been universal, and in one described by Hunt and McNee it was so severe that lumbar puncture was performed with the object of excluding meningitis.

As already stated, the commonest sites of pain are the shin bones and tibiales antici muscles. The pain is usually of a dull aching character, increased by movement, and relieved to a certain extent by rest. It is practically always bilateral, but a few cases have recently been reported in which the left shin only was affected. Pain in the back is also a fairly constant symptom. Indeed, it may be said that pain and tenderness on pressure may be present in any part of the surface of the body. The muscles of the arms and thighs are common locations, and in a considerable number of cases the bony prominences and ligaments about the joints, particularly the knees and ankles, are painful and tender. In a small proportion of cases the pain and tenderness may be localised in nerves. A nerve was involved in five of our cases. Of these, the ulnar was the nerve affected in three cases, the median in one, and the radial in one. The symptoms referred to the nerves are those of a neuritis.

The physical examination of the tibiæ does not elicit anything of much diagnostic value, except extreme tenderness on pressure, which has already been referred to as an outstanding symptom of the disease, and I have never been able to satisfy myself that appreciable periostitic thickening is present, and the few skiagrams of the tibiæ which I have had made do not indicate that it exists. In some cases slight redness of the skin over the internal surface can be made out.

Etiology.

There has been a good deal of discussion as to the etiology of trench shin and trench foot, but the causation still remains more or less obscure. Three causative factors—namely, constriction, infection, and exposure to wet and cold—appear to exist.

Constriction.—Amongst the various contributory factors constriction appears to be a very important one. A clinical study of the cases indicates that the frequency of localisation in the legs is favoured by the wearing of puttees. The fact that most cases occur among privates and non-commissioned officers who are in the habit of wearing puttees supports this view. The lower third of the tibia is not commonly involved, because of the protection afforded this part of the leg by the boot. Anything which tends to impede circulation of the limb, such as tightly tied boot-laces or puttees, may thus contribute to the setting up of the condition. This is recognised by the German writers, who give the disease the name "gaiter pain." In addition to obstructing venous circulation, tight bandaging of the legs by puttees tends to produce a continuous loss of heat. This is important, because cold seems to be one of the chief causative agents of the disorder.

Infection.—The view that the disease is primarily due to an infection is gaining more and more adherents, and is supported by the fact that in the Army it is met with almost exclusively in men who have been in or near the trenches. In my opinion the affection is caused by a micro-organism which has a marked elective action upon fibrous tissue. This theory affords an explanation of the occurrence of myalgia, periostitis or osteo-periostitis, rheumatism, and neuritis as symptoms of the disease. The severe headache which occurs in some cases may be due to a fibrositis localised in the meninges of the brain. Whilst the brain tissue itself is insensitive, the dura mater is richly supplied with nerves, and therefore a fibrositis localised in the meninges would give rise to pain in the head. This was first called attention to, we think, by Dr. Harry Campbell. If we accept this theory as to the cause of the headache in the affection under consideration we can readily explain all its characteristics (worse at night, aggravated by coughing, great intensity in some cases, &c.). I would suggest that the indurative headache of gout is due to a similar morbid condition, although Llewellyn Jones, who has given special attention to the study of the latter subject, thinks that it is due to myositic deposits.

Rosenow, who has recently made extensive investigations in regard to the elective affinity of certain micro-organisms for certain tissues, finds that they undergo mutation on variation of the culture media after successive inoculations into animals, but the factors which determine this localisation are still obscure. His experiments were done by intravenous injection in dogs and rabbits of streptococci isolated from appendicitis, ulceration of stomach and duodenum, cholecystitis, rheumatic fever, erythema nodosum, herpes zoster, epidemic parotitis, myositis and endocarditis. The results showed an elective affinity of these organisms for tissues similar to those from which they had been isolated, those from appendicitis producing lesions in the appendix in 68 per cent., and those from myositis in 75 per cent. of 40 animals, whilst gastric hæmorrhage resulted in a large proportion of those inoculated with cultures obtained from cases of gastric and duodenal ulcer. The gonococcus exhibits a marked affinity for fibrous tissue, Friedländer's bacillus for joints, the tetanus toxin for motor ganglion cells, the diphtheria bacillus for the faucial tonsils, the meningococcus for the meninges, the pneumococcus for the lung, the typhoid bacillus for the lymphatic tissues, the virus of rabies for the central nervous system, that of anterior poliomyelitis for the anterior horns of the spinal cord, the malaria parasite for the red blood corpuscles, and the trichina spiralis for the muscles. By the inoculation of cultures of streptococci (*Streptococcus viridans*) obtained from rheumatic lesions, he

produced typical rheumatic myositis in rabbits. It is interesting to note that in Rosenow's experiments the virulence of some of the organisms was increased by exposure to cold. The fact that the virulence of these organisms is intensified by cold explains the influence of a low temperature in favouring the onset of rheumatic affections. On killing the animals 48 hours after inoculation, many of them showed no other focal lesions than those of the organs in question, and in others the elective lesions were the only severe ones, the rest being insignificant.

Flexner is trying to determine experimentally whether the lesions in the elective tissues are due to the lodgment in them of a larger number of bacteria than in other organs, or whether the bacteria lodged in equal numbers in other organs are capable of surviving only in the elective one. So far the indications point to the former supposition as the correct one, and it appears that the cells of the elective tissue draw the bacteria from the circulation as by a magnet—that is, a process of absorption.

Exposure.—The view that exposure to cold and wet is an important factor in the etiology, together with the fact that the symptoms include, amongst others, pain in the region of joints, ligaments, and muscles, suggests that the morbid condition may be of a rheumatic nature. This hypothesis does not, however, materially add to our knowledge of its genesis, because it is difficult to explain exactly what is meant by the term rheumatism. If we look upon trench shin as a form of rheumatism, the great majority of cases should be classified as that variety of rheumatism which spares the joints but affects the periosteum, ligaments, nerves, and other tissues. This type is sometimes designated "abarticular rheumatism." As examples of abarticular rheumatism we may mention myalgia, rheumatic iritis, rheumatic sciatica, rheumatic polyneuritis, and rheumatic facial neuralgia. Possibly cases of so-called fibrous rheumatism of joints, a condition characterised essentially by morbid changes in the ligaments with little or no change in the interior structure of the joints, may belong to the same category.

The conception of the existence of a pathological condition which may be termed infectious fibrositis is, I think, a useful one in medicine, as it gives a clearer idea of the origin of some diseases which are now recognised as clinical entities, chiefly from the study of their symptomatology. Fibrous tissue is very widely distributed in the body, and may, indeed, be said to form the framework of the body. Moreover, its chemical composition, in common with that of bone, probably does not vary materially with the organ to which it belongs. It is therefore easy to understand that the fibrous tissue in the muscles, nerves, and ligaments will exhibit an elective affinity for the same causative agents of disease as it appears to do in the condition which is now under consideration.

Diagnosis.

In the recognition of the disease the important points are the following: (1) A history of headache and fever in the early stage; (2) the presence of leucocytosis, even in the absence of fever; (3) pain and tenderness on pressure over the tibiæ and tibiales antici muscles; (4) the presence of a neuritis, particularly of the upper extremity; (5) the presence of pain in the ligaments and bony prominences around joints; (6) the greater intensity of the pain in the head, muscles, bones, and joints at night; (7) the prolonged course of the disease, usually from one to three months.

The characteristics of the pain, whether the morbid process be localised in the head, bone, ligament, joint or nerve, are sometimes of value in diagnosis. As already stated, in most cases the pain is worse at night. Some patients state that its intensity is increased by damp weather, others that it is aggravated by the application of heat. A common statement is that it is of a gnawing character, with exacerbations, during which it is "jumping" or "stabbing." Headache and pain in the shins are frequently so severe at night that it is impossible to obtain sleep without the administration of morphine.

Differential Diagnosis.

The symptomatology of trench shin may closely resemble that of trench fever. Indeed, there are some writers who maintain that the two affections are the same. Major T. Houston and Captain J. M. McCloy are two authors who hold this view. They recognise four different types, two described by McNee and Renshaw and two by themselves. They are of the opinion that all the types have the same symptomatology at the beginning, the difference being dependent on the course and duration.

Type 1.—In this type the temperature, which may rise as high as 103° or 104° F. during the first one or two days, tends to fall on or about the third day to normal or even subnormal. It then rises again, and fever may last for six days to a week, after which the temperature falls, with complete relief of the symptoms.

Type 2.—This type is less common, and exhibits the characteristics of relapsing fever. The initial attack lasts about three days, and when the temperature falls the patients feel so well that many of them have been returned to duty. Some days later the symptoms recur, often with a temperature of 103° or 104°. This relapse differs from that seen in the first type of case, in that it is the first of a series. Hunt and McNee state that the average duration of the relapsing type is not less than three or four weeks. In individual cases it may be considerably longer than this. McNee and Renshaw state that they have seen only 20 characteristic cases of this type, but that their experimental results indicate that it may supervene on the basis of the first type, showing that both forms are simply varieties of one and the same disease.

3. Myalgic type.—In the majority of these cases there was no history of previous rheumatism. It differs from the types previously described in that there is only one period of pyrexia, lasting from a few days to a week, whilst the myalgic pains, which are usually limited to the lumbar region and lower limbs, especially the shins, persist after the pyrexia has disappeared, in some cases for several weeks. Pain is worse at night and in cold damp weather.

4. Septicæmic type.—In the septicæmic type the onset is almost always sudden, and fever, without intermissions, persists for as long as from 11 to 30 days. Headache is a most persistent and severe symptom, and there are sometimes definite rigors, nauses, and vomiting. These last symptoms appear to be comparatively rare in the other three forms. After the temperature has fallen to normal recovery is usually rapid, there being no recurrence of the pains.

According to the above classification the affection which forms the subject of this paper would be of the myalgic type. I am not convinced that the classification of Major Houston and Captain McCloy is correct. The important symptoms of trench shin, in addition to the fever and leucocytosis, are headache and other symptoms which might be called rheumatic. The parts involved have been referred to in discussing the symptomatology. In trench fever headache and pain in various parts may be present, but in the great majority of cases these symptoms are not outstanding and are only present during the febrile stage. In some cases, however, pain in the shins may be present for two or three weeks, but this pain is not usually intense. Moreover, headache and soreness or pain in the back and other parts are common manifestations in the febrile stage of many morbid conditions. The difference between the origin of these symptoms and the origin of the manifestations of trench shin is dependent upon the difference in the affinities of the bacteria for fibrous tissue.

Prognosis and Treatment.

The course of the disease is very slow, but, as will be seen later, it varies considerably in individual cases. Recovery eventually takes place, however, after a period of two or three weeks to two or three months. As far as we know, there are no sequelæ. The best guide to progress in recovery is the intensity of pain, and if it gradually diminishes from day to day recovery may be expected in from two to three weeks. The leucocyte count also sometimes gives valuable indications in regard to prognosis, as recovery within a short time may be looked for if it is within normal limits.

The treatment is chiefly preventive. It is obvious that one of the first essentials is the avoidance of anything, such as tight boots or puttees, which is likely to obstruct circulation. Lorrain Smith, Ritchie and Dawson suggest the advisability of substituting moleskin leggings for puttees. These provide the protection of an ample cushion of air and drain more readily than puttees, thus minimising the loss of heat. Delépine suggests waterproof bags made of oiled silk, similar in shape to fishing-boots. The outer sock, which should be sufficiently large to draw over the oilskin, should be made of material which is not liable to shrink when wet.

In a book describing the preventive measures which were found most effective in the winter campaign of the Japanese Army in Manchuria it is recommended that the feet, legs,

and, if necessary, the whole of the body, should be thoroughly rubbed with animal fat or animal oil. In order to obtain the maximum effect the oil should be of high boiling-point and used in considerable quantity. Daily massage of the parts between periods of trench duty has also been recommended. A similar preventive measure has been much used in the present war—that is, applying vaseline or whale-oil liberally to the feet and legs.

In the curative treatment measures for treatment of an infectious disease are indicated. Rest in bed is essential. Acetyl-salicylic acid and phenacetin may be tried for the relief of pain, but it is often necessary to give morphia. In cases in which the pain in the tibiæ has been very severe an incision through the periosteum has sometimes been made, and is said to be of much value.

McNee and Renshaw, on the assumption that antibodies to the infected virus might develop in the course of spontaneous cure, removed 20 c.c. of blood from a patient 10 or 12 days after his last relapse, and four hours later injected the serum into the veins of two who were just beginning to relapse. It appeared to have no influence whatever on the course of the disease.

Illustrative Cases.

CASE 1.—Private H. The patient had been formerly a coal-miner, and had been in the service for one and a half years. His habits had been temperate and his previous health very good. He was admitted to No. 4 Canadian General Hospital, Salonica, on Jan. 27th, 1916. He stated that his illness commenced three days before admission, the first symptoms being headache and pain in the shins. He attributed the pain in the shins to exposure and a march of 19 miles. On the march he wore puttees, but they were not tight.

Present condition.—The patient complains of pain and a burning sensation in the shins, the dorsal surface of the feet, and the central portions of the tibiales antici, the pain being more severe at night and in wet weather. At night it is continuous, with exacerbations every few seconds, during which it is stabbing in character. There is pain on extension of the foot. The parts previously referred to are painful on deep pressure. Reflexes normal and active. No disturbance of epicritic sensation. Urine normal. White blood corpuscles 19,000.

CASE 2.—Sergeant-Bugler M. The patient, aged 28, had suffered from rheumatic fever at the age of 10 years. He had been in South Africa for two years and in India for seven years, and during these nine years had had three attacks of fever. He stated that aching pains in the leg had been fairly constant during the last month. His general health had been fairly good, but he felt weak and his appetite had been poor. His throat had not been sore, and his teeth were in good condition. There was no gastro-intestinal disturbance. During the last three weeks he had been in the hospital, but the pain had not been relieved.

Present condition.—On examination the heart, lungs, and urine were found to be normal. White blood corpuscles 22,000. Temperature normal. Soreness and pain are limited to the inner surfaces of the tibiæ and the dorsal surfaces of the feet. The tibiales antici are not involved. Both flexion and extension are more painful than normal. Reflexes normal.

CASE 3.—Sergeant B., admitted to No. 4 Canadian General Hospital on Jan. 25th, 1916. He stated that about the middle of last December he began to suffer from headache and pain in the back and thighs, especially on rising in the morning. It usually subsided after he had been moving about for a while. On Jan. 1st the pains had seemed to leave the back and thighs and become localised in the shins and front and side of the knees. There was also slight pain in the elbows.

Present condition.—Pain in shins and at the side of the knees over the tuberosities of the femur. It was of a dull throbbing character and was worse at night. White blood corpuscles 8000.

CASE 4.—Sergeant W., aged 31, admitted to No. 4 Canadian General Hospital, Salonica, on Jan. 24th, 1916. The illness commenced on Jan. 16th with fever, headache, and pain over the shins, which continued for four days, being worse at night. The headache lasted three days. When taken ill the patient was working at headquarters and had had no marching or exposure since December, when he was in Serbia.

Present condition.—There is marked tenderness over the bellies of the tibiales antici on both sides, and slight tenderness over the crests of the tibiæ, together with occasional pain in the knees. Dorsiflexion of the foot is painful. Pain is relieved by the application of heat. White blood corpuscles 16,000. Examination otherwise negative.

CASE 5.—Private W., aged 26. Two months previously, while in Egypt, he had found that he was unable to march owing to pain and stiffness in the legs. There was no fever. He had not been in the trenches or exposed to cold. During his previous seven months in France he had had no trouble.

Present condition.—On admission to No. 4 Canadian General Hospital on Jan. 26th complained of pain in the knees and shins. There was marked tenderness over the tibiales antici on both sides, especially above the ankles along the course of the tendon, and slight tenderness over the internal surfaces and crests of the tibiæ. The pain was worse at night, and not relieved by heat. Dorsiflexion of the foot painful. No fever. White blood corpuscles 14,000. Examination otherwise negative. On Feb. 5th the white blood corpuscles numbered 13,500. Pain still severe, the slight tenderness over the tibiæ remaining as before.

CASE 6.—Private L., aged 34, admitted to No. 4 Canadian General Hospital on Jan. 24th, 1916. Ten days previously, whilst on guard, he began to suffer from headache and pain in the front of the legs. It came on quite suddenly. He had been trench digging both in France and Salonica, but had not recently been exposed much to either cold or wet.

Present condition.—There is tenderness over the internal surfaces and the crests of the tibiæ. The tibiales antici are tender on pressure. Pain is worse at night and increased by heat. There is a callous area over each instep. Temperature 101·4° F. White blood corpuscles 12,000. On Feb. 1st marked pain and tenderness over internal surface of the tibiæ, in bellies of tibiales antici on both sides; worse at night. Since admission the temperature has been irregular, going up to 100° F. White blood corpuscles 10,000. Examination otherwise negative.

CASE 7.—Lance-Sergeant B., aged 24, had enlisted in Toronto on May 28th, 1915. In England Dec. 1st, 1915. In France Feb. 20th, 1916. Had an attack of *la grippe* about the end of February, 1916. The present illness began during the first week of June with headache, pains in the joints and muscles, and fever. The headache was aggravated by coughing and was worse at night. The patient was sent to a field hospital, where he remained for nine or ten days. Whilst there the temperature was normal or subnormal in the morning and slightly elevated at night. He returned to duty, but was unable to carry on. He was sent to hospital, Boulogne, and from thence, on June 30th, to the Ontario Military Hospital, Orpington.

Present condition.—Complained of weakness, of loss of appetite, and of pains in shoulders, elbows, wrists, knees, and ankles. Three days later—i.e., July 3rd—pain experienced in shins, which gradually became worse, and at the same time the pain in the joints became less severe. In about a fortnight the pain in the joints subsided. That in the shin bones was worse at night and seemed aggravated by dampness. Relief for an hour or two was sometimes obtained by taking 10 grains of acetyl-salicylic acid. The pain was of a gnawing character and was localised in the middle third of the tibiæ. The surfaces of the bones were sensitive and tender on pressure. Since admission the temperature had been normal or subnormal. On August 13th white blood corpuscles, 15,400; polymorphonuclears, 65 per cent.; lymphocytes, large and small, 31 per cent.; eosinophiles, 4 per cent. On the 25th the patient complained of a dull pain and tenderness on pressure at the back of the right shoulder, at about the level of the sixth or seventh cervical vertebra. On the 28th there was still pain at the back of the right shoulder. There was also pain along the posterior part of the internal surfaces of the arm, extending along the ulnar side of the forearm into the little finger and the adjacent half of the ring finger. The ulnar nerve was sensitive to pressure at the elbow. No material weakness of muscles supplied by ulnar nerve. Electrical reactions normal. Hyperæsthesia of little finger and adjacent half of ring finger. Pain at back of right shoulder produced by raising the right arm from the side. Slight pain in shin bones. On Sept. 9th the pain had almost gone from the shins, and that in the right arm had lessened. On Oct. 3rd the patient was free from pain and his general condition was fair.

The interesting points of this case are: (1) During the first two or three weeks of the illness the pain was chiefly limited to the joints; (2) the tibiæ became involved during the third week; (3) the ulnar nerve became involved during the eighth or ninth week; (4) the comparatively high leucocyte count in the absence of fever.

CASE 8.—Sergeant B., aged 43. Service 23 months. Health before enlistment good. On July 7th had been operated upon for piles at Dannes Camiers, and subsequently made a good recovery. About three or four weeks later the present illness began with pain at the back of the neck and left shoulder, the temperature being elevated. Three days later pain in shins and forearms. On August 12th transferred to Ontario Military Hospital, Orpington.

Present condition.—August 13th: Complaint: Pain in shins, forearms, and in a small area near the seventh cervical vertebra at the back of the left shoulder. Much worse at night. Pain in shins continues and of a gnawing character, with exacerbations, during which it radiates to the thighs and feet and is equally severe in both legs. The posterior and internal surfaces and crests are slightly sensitive. Pain and tenderness in the tibiæ are limited to the middle thirds of the bones. In the forearms there is little pain, but there is tenderness on pressure for about 5 inches above the wrist in a longitudinal line between the radius and ulna and at the back of the left shoulder just to the left of the seventh cervical vertebra. Raising the left arm from the side causes pain in the back of the left shoulder-joint. Temperature slightly elevated. White blood corpuscles, 15,500. The differential count gave the following percentages: polymorphonuclears, 75; small mononuclears, 15; large mononuclears, 6·5; basophiles, 1·5; eosinophiles, 1·5; transitional, 0·5. Sept. 2nd: Very little pain in shins. Area at back of shoulder and forearm still tender. Temperature has been normal for six days. 5th: Improved; very little pain, and only slight tenderness in areas mentioned above. Oct. 18th: Pain completely gone.

In this case, although the pain at the back of the left shoulder was similar to that of Case 7, there was no pain along the course of the ulnar nerve.

CASE 9.—R. H. L., aged 33, had enlisted in February, 1915, and was sent to France in February, 1916. The present illness commenced on Sept. 2nd, 1916, with headache, pain in arms, legs, and back, all these symptoms being worse at night. Slight fever during the first three days. The patient was sent to a clearing station, and thence to a hospital in Boulogne, and ten days later to the Ontario Military Hospital, Orpington.

Present condition.—Complaint: Pain in shins, back, thighs, biceps, and in tibiales antici. Worse at night, and all the painful areas tender on pressure. On coughing pain felt at the back of the head. White blood corpuscles 11,000.

CASE 10.—E. J. K., aged 49. Service nine months. Enlisted February, 1916, and was sent to France the following month. Health good until August 25th, when he began to suffer from pain in the left knee. Five days later pain was felt behind the left shoulder and a sensation of "pins and needles," as well as pain in the little and ring fingers of the left hand. He paraded sick, and was sent down the line to Boulogne, and thence two days later to Ontario Military Hospital, Orpington.

Present condition.—Sept. 3rd: Complaint: Pain and sensation of "pins and needles" in little and ring fingers of left hand, in ulnar side of left forearm, in the back of the left shoulder and left side of the neck, and slight pain in the left knee-joint. All the painful areas sensitive to pressure. The "grip" of the left hand weak. The muscles supplied by the ulnar nerve react to the faradic current. 10th: No pain in left knee. Condition of left arm remains about the

same. White blood corpuscles 10,400. Oct. 1st: Less pain in left arm. Nov. 1st: Strength of left hand improved. Coughing causes severe pain in left side of chest. Nov. 21st: Slight pain in ulnar side of arm. Pain on left side of chest on coughing. Dec. 1st: Patient still complains of slight pain in hand, left shoulder, and along ulnar side of left arm.

In this case the special localisations of the morbid process were probably limited to nerve and ligament.

CASE 11.—Private L. Patient enlisted in September, 1914, and was sent to France in August, 1916. In November, 1916, he reported ill on account of loss of power in right forearm and fingers. He suffered no pain except headache at the beginning of his illness. Immediately prior to becoming ill he had been exposed in the trenches to cold and wet, and one week after the beginning of his illness pain began in the shins. This lasted about ten days. Admitted to Ontario Military Hospital Dec. 3rd, 1916.

Present condition.—Patient unable to extend the right wrist (wrist-drop). Flexion and extension of right elbow-joint present, but on forced flexion at this joint the supinator longus does not contract. Inability to extend the proximal phalanges of the fingers. Over the back of the thumb and the radial side of the hand is an area of partial anæsthesia. Extensor muscles of hand and supinator longus react to faradic current, but the contraction to galvanic stimulation is changed. A.C.C. greater than K.C.C. Heart, lungs, and abdominal organs normal. White blood corpuscles, 10,600; polymorphonuclears, 53 per cent.; lymphocytes, 47 per cent. Jan. 24th: Patient very much improved. Can extend the hand slightly. Feb. 8th: Recovery.

This case was sent as one of musculo-spiral paralysis of unknown origin. From the clinical history I should judge that it may be classed with trench shin.

Bibliography.

1. Herringham, Sir W.: Quarterly Jour. Med., Oxford, 1915-16, x., 429.
2. Hunt and Rankin: Cited by Sir W. Herringham, loc. cit.
3. Hunt and McNee: Quarterly Journ. Med., Oxford, 1915-16, 442.
4. McNee and Renshaw: Brit. Med. Jour., 1916, i., 225.
5. Houston and McCloy: THE LANCET, 1916, ii., 632.
6. Lorrain Smith, Ritchie, and Dawson: Journ. Pathol., 1915-16, xx., 160.
7. Campbell, H.: Brit. Med. Jour., 1914, ii., 578.
8. Llewellyn Jones: "Fibrositis," 1916.
9. Rosenow: Journ. Amer. Med. Assoc., 1915, lxiv., 1968; lxv., 1687. Journ. Infec. Dis., March, 1915.
10. Flexner: Journ. Experimental Med., i., 211.
11. Delépine: Brit. Med. Jour., 1915, ii., 888; THE LANCET, 1915, i., 271, 463.

AMŒBIC DYSENTERY AND ITS RELATIONSHIP TO A FORM OF DIARRHŒA OCCURRING IN EGYPT.

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DURING the past year the opportunity has been given me of studying the illnesses among naval ratings during the first few months of their residence in Egypt. Diarrhœa and amœbic dysentery have been by far the commonest causes of ill-health, and I am here suggesting a relationship between these two conditions.

Diarrhœa with Gastric Symptoms.

Of the Europeans who arrive in Egypt for the first time, it is probable that nearly 90 per cent. suffer from a form of diarrhœa, associated with gastric symptoms, which is so common that it is known among Anglo-Egyptians as "Egyptian stomach." The first attack usually comes on within a fortnight of arrival in the country, while subsequent attacks may recur at intervals of from one to two weeks. After a residence of roughly six months the disease entirely subsides and does not again appear. Owing to the comparatively slight symptoms the condition has failed to attract any very great notice among specialists in tropical medicine.

A typical attack usually begins in the early hours of the morning, although it may commence at any hour of the day or night. At first there is only slight abdominal uneasiness, but this is quickly followed by definite griping pains, confined for the most part to the epigastric and umbilical regions. There is a marked desire to empty the bowels, though evacuation gives little relief. As many as 10 or 15 stools may be passed during the day. Nausea and vomiting are present in about three-quarters of the cases, while in a few instances headache is a marked symptom. The temperature is slightly raised in the evening —98·8° to 99·8° F., while the posterior part of the tongue is covered with a brownish fur. The diarrhœa does not persist for more than two or three days at the outside; it is usually followed by constipation. About a week generally elapses before the bowels regain their normal action. A similar attack may recur within a fortnight or three weeks of the original attack. The fæces are always fluid in character and in a typical case resemble pea-soup; blood and mucus are absent. The blood shows no definite changes, except a slight but constant increase in the large mononuclear leucocytes (10–18 per cent.).

The condition is not confined to any particular class; officers and men, whether living ashore or afloat, are equally affected. It has no relationship to the presence of sand-storms, which in this country are confined to the early spring months. Dietetic errors are hardly likely to be responsible for so prevalent a condition. There appears, however, some ground for considering the disease to be of an infective character. Thus, of 120 sailors arriving in Egypt in March, 1916, 30 had reported sick with the condition by the end of July, while a further 50, on questioning, confessed to having had attacks of diarrhœa and gastritis, though they had not deemed the occurrence worth reporting. Since August these men have been entirely free from this condition, though they have not been exempt from attacks of amœbic dysentery. As a general rule, the diarrhœa and gastritis are more severe in persons under 20 and over 40 years of age.

Amœbic Dysentery.

The second most important cause of sickness among naval ratings has been amœbic dysentery. Cases of this condition can be separated into two classes: (1) Old dysenterics who have relapsed; (2) first attacks in persons who have never before been abroad. In the present series of cases the former class constitute nearly 20 per cent. of the total number, and as in the majority of instances the dysentery was first contracted in Gallipoli, during the Dardanelles campaign, since then these cases must have been acting as "convalescent carriers." Doubtless an examination of the stools of everyone in Egypt, if such a thing were possible, would reveal the presence of a very large number of carriers of this description.

For the most part, the cases all conformed to the classical type of a mild amœbic dysentery, with blood and mucus in the stools. The clinical symptoms were headache, lassitude, slight abdominal pain, and diarrhœa, with some tenesmus. The temperature was slightly elevated, but rarely exceeded 100°. On microscopical examination *Entamœba histolytica* was found to be present in the stools in every instance, though, as is so common in this form of dysentery, the excretion of entamœbæ was of an intermittent character.

Apart, therefore, from the condition of the stools, the clinical symptoms were very similar to those described as occurring in the condition known as "Egyptian stomach." In the case of first attacks of dysentery, the dysenteric symptoms do not as a rule manifest themselves until the patient has been resident in the country for a few weeks at least. In one instance, however, a sailor, 18 years of age, developed a typical attack of amœbic dysentery two days after arrival in Egypt. The patient stated that he had never before been abroad, but two years previously had had an attack of dysenteric-like symptoms. Inquiry, however, showed that both the boy's father and brother were in the Army; the former had returned from India shortly before the patient's first attack. This, therefore, appears to have been an autochthonous case occurring in England. An attack of dysentery may, however, manifest itself after a residence of some months or even years, but in many cases there appears to have been a previous history of "Egyptian stomach." Thus inquiry into 40 cases of dysentery occurring for the first time elicited that in 36 instances there was a previous history of one or more attacks of "Egyptian stomach," preceding the onset of dysenteric symptoms. The intervals elapsing between the last attack of "Egyptian stomach" and the commencement of the dysentery varied from a few days to some months.

Relationship of the Two Affections

In order to determine whether there was any relationship between the two conditions a microscopical examination of the fæces was carried out in 110 cases of "Egyptian stomach." In regard to the presence of entamœbæ, the following results were obtained:—

Entamœbæ entirely absent	8	cases.
Entamœba coli present	10	,,
Entamœba histolytica	36	,,
Entamœba minuta (Elmassian)	49	,,
Entamœba minuta (Elmassian), together with tetragena cysts	7	,,

A method of vital staining was employed, neutral red being used in a dilution of 1 in 10,000, as recommended by Rogers.[1] By this means the entamœbæ are coloured a rose pink, while the background remains unstained.

An analysis of the above figures shows that in 43 instances the causal agent of amœbic dysentery—*Entamœba histolytica*—was isolated from the stools. It was present either in the vegetative form (36 cases) or in the encysted stage (7 cases). It has been recently pointed out that this latter stage may occur, not only in chronic, but in very mild cases of dysentery.[2]

In 56 instances there was present, either alone (49 cases) or in conjunction with tetragena cysts (7 cases), an organism which was probably *Entamœba minuta*. This variety was first described by Elmassian as occurring in soft diarrhœal stools.[3] It has lately been found to be much more common than was formerly supposed,[4] while the majority of authorities are now agreed that it is merely a stage in the developmental cycle of *Ent. histolytica*, probably a precystic trophozoite stage.[5] The minuta variety resembles *Ent. coli* in size, but differs from it slightly in appearance. Not infrequently the endoplasm contains a few red blood corpuscles. The only definite means of differentiating between *Ent. coli* and *Ent. minuta* lies in inoculation experiments. In the present instance these unfortunately could not be performed. There is, however, presumptive evidence to prove that in the cases above referred to the organism present was *Ent. minuta* and not *Ent coli*.

When I first studied "Egyptian stomach" I treated the condition as one of simple diarrhœa. Bismuth and opium were prescribed with excellent results so far as the relief of the immediate symptoms was concerned. Within a month, however, eight of the patients so treated developed classical attacks of amœbic dysentery, *Ent. histolytica* being isolated from the stools. Since that date all cases of "Egyptian stomach" which have come under me have been treated with a course of emetine injections, with the result that only one of the patients so treated has subsequently developed amœbic dysentery.

To summarise the results, it may be said that of 110 cases 43 showed the presence of *Ent. histolytica* either in the vegetative or encysted form, while in 49 there was some evidence to prove its presence in the minuta form.

In those countries where it is endemic, amœbic dysentery is of very common occurrence, a fact which is illustrated by the large amount of original work that has emanated from Egypt and India on the subject. Although no figures are available as to the number of carrier cases in these two countries, it must be very considerable. In the case of Tonkin it has been found that no fewer than 8 per cent. of the population are dysentery carriers.[6]

It has long been recognised that every person is at some time or another exposed to infection from tubercle bacilli; in exactly the same way it is probable that in a country such as Egypt everyone is sooner or later exposed to entamœbic infection. Not only is there a vast army of carriers among the general population, but the agents of dissemination in the shape of flies are also constantly present. It would, however, appear that in the majority of individuals the entamœbæ are rapidly removed from the system.

The presence of active amœboid forms in the intestine is correlated in the first instance with certain clinical symptoms—the condition known as "Egyptian stomach." As the vegetative activity of the entamœbæ disappears, the acute symptoms also decrease, while the cysts which are then formed may either be destroyed in the intestine or else continue to be passed in the process of defæcation. The clinical symptom "diarrhœa" is in reality a protective mechanism, whereby the organism seeks to rid itself of deleterious matter in the intestine. The fatigue and a consequent lowering of the resistance caused by excessive evacuation are only secondary effects. In some individuals, the entamœbæ, as has been said before, continue to flourish, without, however, giving rise to any symptoms, until such time as the general resistance becomes lowered, when an attack of dysentery may supervene.

Before the war amœbic dysentery was comparatively rarely met with in the British Isles; with the cessation of hostilities and the return from hot climates of large bodies of men it is probable that the disease will become much more common, unless measures are taken to detect and effectively treat all carrier cases. This, however, is a work of the very greatest difficulty. It is therefore essential to prevent, by all possible means, the formation of such carriers. One of the methods to be employed in this connexion should be the treatment of all suspicious conditions, such as "Egyptian stomach," with what is practically the only specific for amœbic dysentery—namely, emetine.

References.

1. Rogers: Sixty Cases of Amœbic Dysentery illustrating the Treatment by Ipecacuanha and Emetine respectively. Indian Med. Gaz., 1912, xlvii., 421–427; THE LANCET, 1912, ii., 1062.
2. Fantham: The Animal Parasites of Man (1916), p. 38
3. Elmassian: Centralbl. f. Bakter., Orig., lii., 335.
4. Phillips: Amœbiasis and the Dysenteries (1915), pp. 10–12.
5. Darling: Annals Trop. Med. and Parasitol, 1913, vii., 321.
6. Mathis: Bull. Soc. Méd. et Chirug. Indo-China, iv., 474.

THE TREATMENT OF GONORRHŒA IN A FIELD AMBULANCE.

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THE essential equipment of a field ambulance is for the reception and treatment of casualties occurring in the field. The scale of equipment shows that it has never been contemplated that such a unit will ever be called upon to treat cases of gonorrhœa. Theoretically no man is allowed to proceed on active service while suffering from venereal disease, and (also theoretically) he is not able to acquire it while in the field. In practice this theory often breaks down, and a case of gonorrhœa or syphilis may, and often does, fall to be treated in a field ambulance. Such a case may have to remain in the ambulance for weeks before it can be transferred to a hospital which is equipped with the proper means for administering treatment. For example, when the transport, carrying some 3000 troops, on which the field ambulance to which I belong had been two days at sea, *en route* for the Dardanelles, five men were admitted to the troops' hospital suffering from acute gonorrhœa. These were evidently new first infections, and at the medical inspection of troops prior to embarkation had presented no symptoms, thus escaping detection by the regimental medical officers. As a field ambulance was on board, to it fell the medical care of the troops, and as these cases of gonorrhœa were handed over to me I was presented with the problem as to how they were to be treated efficiently and rendered fit to return to full duty in the shortest possible time with the slight means of treatment at our disposal.

It is of very vital importance that cases of gonorrhœa occurring in soldiers, and especially in those proceeding on active service or actually in the field, should be brought under treatment immediately and efficiently, that they should be cured quickly, and that the cure should be a permanent one. To the "slacker" a chronic gleet is a heaven-sent gift to enable him to report sick and so evade his duty. A certain type of soldier—happily not a common one—will retain a gleet and take admirable precautions against it being cured, so that he can produce it on sick parade the very moment that he knows there is any hard work in front of his battalion. The penalties for the concealment of venereal disease do not act as a deterrent. The loss of efficiency when an acute gonorrhœa is allowed to lapse into the chronic state is very great indeed.

Consideration of Methods of Treatment.

A rapid, efficient, and permanent cure was the object aimed at in the five above-mentioned cases. The four following methods of treatment suggested themselves: (1) Drugs—e.g., copaiba, &c.; (2) injections with a syringe; (3) a combination of (1) and (2); or (4) Janet's method of pressure irrigation or "lavage." The first three methods were discarded because they are unscientific, inefficient, and dangerous.

Drugs are slow in their action, extremely uncertain, and create digestive disturbances, rashes, &c. They are the stock-in-trade of the venereal-treating chemist and the quack; and in a proportion of the cases where they are prescribed by a medical man they are simply a salve to the conscience of a lazy practitioner. I have known many instances where an untreated gonorrhœa—in men on board sailing ships, for example—has progressed just as favourably

as one which has been treated by the swallowing of copaiba, sandal-wood oil, methylene blue, and so on.

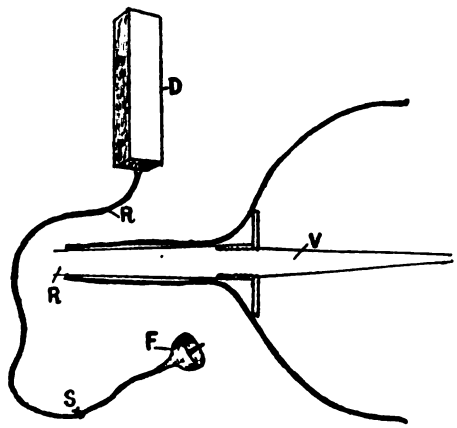
The use of a syringe, whether in the hands of a surgeon or of the patient, is fraught with danger. To cause a patient with an acute gonorrhœa to first empty his bladder and then to force a jet of silver nitrate or some such solution against his compressor urethræ muscle too often results in some infection being forced back behind the compressor into the posterior urethra or bladder. A certain period of time elapses before the patient collects enough urine to again micturate and wash out the injection, and during this time the gonococci have had the chance of implanting themselves in virgin soil, and the common sequelæ—posterior urethritis, epididymitis, and cystitis—result. Further, in gonorrhœa micturition takes place before sufficient urine has collected to properly wash out the infective material and a certain amount of it remains. A syringe, even in the hands of the surgeon, is unsafe; in the hands of the patient it is dangerous. Too often the patient, having been taught by the surgeon to use a syringe, decides that he can do it as well as the surgeon. He decides to save the surgeon's time and his own money, so, armed with a syringe and an injection solution, he solemnly washes the infection into his bladder. The syringe is bad treatment and the sooner it is relegated to the museums as a relic of the dark ages of urology the better.

No matter how careful one may be, one is always in danger of overcoming the resistance of the compressor urethræ muscle, forcing back some gonococcal material and extending and complicating an originally simple disease. There is present, but in a lesser degree perhaps, the same danger in cases which are treated by drugs internally. The painful erections to which these patients are subject frequently cause slight relaxation of the compressor and backward extension of the disease.

Adherence to the first three methods enumerated causes the complications of gonorrhœa which are, unfortunately and unnecessarily, so familiar; and when complications occur in a case of simple gonorrhœa it is a proof that the treatment is bad or inefficient. No case of anterior urethritis (and all gonorrhœas are at first confined to the anterior urethra) coming under treatment before backward extension has taken place should ever have any complications or sequelæ. The disease begins anteriorly; it should continue anteriorly. It should finish in the same place, and "leave not a wrack behind." By proper use of the Janet method this can be done; improvement is rapid, the relief of symptoms is almost immediate, and the cure is permanent.

The Method Adopted.

Holding these opinions, I was forced to extemporise a much modified Janet's lavage apparatus, as is shown in



Sketch of extemporised Janet's lavage apparatus, with a longitudinal section on a larger scale through the filter funnel showing the nozzle in position. D, douche-can; R, rubber tubing; F, filter funnel; V, vulcanite nozzle; S, stopcock.

the illustration. It was composed of a douche-can with a holding capacity of four pints. This was procured from No. 1 Field Surgical Pannier. Two separate 3-ft. lengths of rubber tubing were also culled from the same source. These were joined together by a vulcanite stopcock. One end of the tubing was fixed to the outlet of the reservoir; the other end was threaded through the stem of an enamelled-iron filter funnel and finally finished off with a vulcanite enema-syringe nozzle, as is shown. The object of the filter funnel is, as in Janet's apparatus, to catch any backwash from the urethra and to protect the surgeon from being splashed with the returning solution. The solution used was potassium permanganate. No definite strength was adhered to, as the urethra gradually acquires a toleration to potassium permanganate. On the first day irrigation was commenced with the solution of a faint pink colour, and this was gradually increased in strength each day.

The theory of the treatment is briefly this. It is to be recognised that the great danger in all local treatment of gonorrhœa is of infective material being carried past the barrier of the compressor urethræ *and being left there*. This danger is realised as being inevitable, and so means are taken to wash out the whole urinary canal from the bladder to the meatus, and thus to ensure that every vestige of infective material is carried away. At the same time, the lavage solution is of such a nature as to render innocuous any slight amount of the organisms which may be present.

The method is as follows. The patient having micturated (thus flushing out the urethra), he is placed lying on his back on a table, with his legs apart and his thighs slightly flexed. Between his thighs is placed a basin to catch any back-flow of solution from the urethra. The glans and prepuce are thoroughly cleansed, the douche-can is raised about 2 ft. above the patient's pelvis, an assistant turns on the stopcock, and a gentle stream of the irrigating solution is allowed to flow. The temperature of the solution is 104° F. The surgeon then inserts the nozzle, while the stream is flowing, into the urinary meatus, and the anterior urethra is thoroughly washed out. An elevation of 2 ft. of the reservoir above the patient's pelvis is not sufficient to overcome the resistance of the normal compressor. The irrigation stream is kept at a steady flow, and by alternately inserting and withdrawing the nozzle from the meatus the anterior part of the urethra is thoroughly flushed with fresh solution. The back-flow is caught by the protective shield of the filter funnel and collected in the basin between the thighs of the patient. The elevation of from 2 to 3 ft. is, while not overcoming the compressor, sufficient to cause a dilatation of the anterior urethra, to open up the crypts and lacunæ, and to bathe them in permanganate solution, thus bringing every part of the urinary canal under the influence of the irrigating solution. If the disease is confined to the anterior urethra that ought to be sufficient. This is all that is done by the syringe method. Theoretically the syringe method stops there. But when it is realised that in spite of all care infection may exist in the posterior urethra, or that while washing out the anterior part the compressor may, as it often does unknown to the patient or surgeon, relax momentarily and allow some infection to pass backwards, then it becomes one's duty to take measures to counteract such a happening and to prevent its consequences. The point to realise is that there is no means of absolutely preventing relaxation of the compressor, therefore one has to suppose that in every case relaxation has taken place, and that it behoves one to take appropriate measures to prevent any damage. The reservoir is now raised to a height of 5 or 6 ft. and the stopcock is opened to its fullest extent. Experience has shown that this elevation is normally sufficient to overcome the compressor. The patient should be instructed to breathe easily and to attempt the act of micturition, thus relaxing the compressor, and the solution will be found to run into the bladder.

Occasionally one experiences a little difficulty in overcoming the compressor. This is usually due to nervousness on the part of the patient. If he is engaged in conversation and his mind is taken off contemplating the novel experience he is undergoing, it will often be found that the compressor is "caught napping" and that the solution will run in. In other cases it may be necessary to "dodge the compressor" by projecting alternately vigorous and weak jets of the solution against it. The assistant can do this by regulating the opening of the stopcock. If the patient has the rationale of the proceedings explained to him, he overcomes his nervousness, takes an intelligent interest in the matter, and can help materially in filling his own bladder. Once the barrier has been overcome the force and pressure of the stream keep the urethral canal patent.

In the most difficult case, uncomplicated by an old stricture, perseverance will always succeed, in spite of the belief

prevalent in many minds that the bladder can only be filled by means of a catheter. The truth is that with a little experience any normal bladder which is guarded by a normal urethra—i.e., one which is free from greatly abnormal narrowing—can be filled by the above method.

By means of percussion and by heeding the patient's sensations one can tell when the bladder is full. When this stage is reached the stopcock is closed, and by compressing the meatus of the urethra with the fingers all the fluid is retained in the urinary passages. The bladder and urethra are now fully dilated by the pressure of the solution; every recess and crevice is bathed in it, and every focus of infection is opened up and subjected to its action. If after the lavage of the anterior urethra any gonococci have been carried back to the bladder, they are now floating, well diluted, in a vast ocean of bactericidal solution. After allowing the solution to remain in the urethra and bladder for 20 or 30 seconds the meatus urinarius is released, and the anterior urethra empties itself. The patient now sits up, and by the act of micturition empties his bladder of the permanganate solution into a basin. The solution usually returns slightly reduced at first. The whole procedure is repeated several times till the permanganate returns unchanged.

It will be found that the first attempt to fill the bladder is the most difficult, but that as soon as the patient overcomes his nervousness and realises what is required of him it becomes perfectly simple. Some patients rapidly learn to do the lavage themselves and carry through the whole treatment in a perfectly easy and skilful manner.

Results of Treatment.

The treatment of the five cases mentioned was followed in accordance with the above principles. Lavage was carried out three times daily for the first three days at 9 A.M., 2 P.M., and 9 P.M. The patients were put on light diet and forbidden alcohol or condiments, but smoking was not restricted. They were given no drugs internally, but were ordered to drink as much water as they could. This excellent diuretic kept the urine bland and non-irritating. On the second day of treatment they reported that they had no pain on micturition, and the discharge, which had been copious and creamy 24 hours before, was thin and small in quantity. On the third day all use for gonorrhœa bags had ceased as the discharge was negligible. From the third to the tenth day they were irrigated twice daily, morning and evening. On the eighth day, in one of the cases, the discharge was completely stopped and he had no other symptoms. He was put on full diet and beer. Next morning he had a slight discharge, so he was returned to treatment. On the tenth day Malta was reached, and the cases now who exhibited no symptoms whatever went sent ashore to hospital, so that a microscopic examination of smears from their urethras could be made as to the presence or absence of the gonococcus, which is the only real test of cure. The "two-glass" test, which was done before they were sent ashore, showed no turbidity in either of the glasses, except in the first glass of the patient who had been put on full diet and beer. In his case there were a few flakes present. The transport left Malta the same day, so that the cases were lost sight of.

The conclusions which present themselves may be summarised as follows. That treatment by the Janet method, as described above, is more successful in rapidity of disappearance of symptoms than any other; that in civil practice experience has shown that the gonococcus can be cleared from the urethra in three weeks by this method; and that there are no sequelæ. These things are perhaps even more important in soldiers on active service than in civil life; and even with the modified and extemporised apparatus used as described the results were almost perfect. Lastly, it is not beyond the resources of a field ambulance on active service to treat efficiently and cure cases of acute gonorrhœa by the method of lavage.

THE HEALTH OF SCHOOL CHILDREN IN DEVONSHIRE.—The medical officer of health for the county of Devon in his annual report states that between 35 and 40 per cent. of the boys leaving the schools under the Devon education committee were under the normal weight. He adds that the boys suffered from insufficient food and rest, and that insanitary conditions existed in the schools and their homes.

RETROGRADE STRANGULATION OF THE INTESTINE FROM CONSTRICTION BY AN EXTERNAL APERTURE.

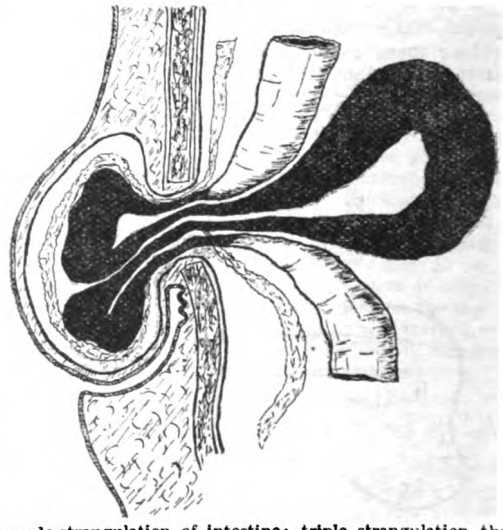
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MADYL'S hernia is a type in which the intestine descends into the sac in a W fashion, thus there are two external loops united by a third, which remains for the most part in the abdomen. Similar cases have been described by Peyrot, Lauenstein, Macewen, Pringle, Laroyenne, and others. In the event of strangulation three loops may be involved. In the case described by Laroyenne,[1] and reported[2] and translated by me, the following was the condition:—

The patient, aged 60, suffered for a long time with a reducible hernia about the size of two fists, which passed from the right inguinal canal into the scrotum. The evening before the operation the hernia became irreducible and signs of complete strangulation of the bowel came on suddenly without distension of the abdomen. At operation next day the sac was opened and abundant lemon-yellow serous fluid escaped. Two loops of bowel presented inside the sac—a portion of the cæcum with the terminal part of the ileum and a loop of small intestine. Both looked healthy without any appearance of ecchymosis or sloughing and the constriction was sufficiently loose to allow them to be drawn down easily for examination of the neck of the protrusion. This manœuvre revealed a third coil of small intestine, joining the two in the hernia, and passing upwards into the abdominal cavity. This portion was completely strangulated, black in colour, and studded with greenish spots of commencing gangrene, an appearance extending far up in the coil. Laparotomy was then done, and the attachment of this loop to the two portions of the bowel in the sac was confirmed. Some bloody fluid with a fœtid odour was found in the peritoneal cavity, but resection was deferred on account of the collapsed state of the patient and the great extent of damaged intestine. The wound was left open, with drainage of the abdomen in the region of the dead gut, but during the night the patient succumbed. An autopsy was made, at which it was found that over six feet of the bowel was destroyed by strangulation. No other abdominal lesions were found.

In résumé, the author considers that the immunity of the cæcum is due to the thickness of its walls. As to the reason for damage to the intra-abdominal small intestine, with escape of the protruding small intestine, he believes that torsion on its axis probably occurred. Such was not noted post mortem, but the conception is favoured by the great length of the bowel, pedunculated in a sense at the internal ring.

FIG. 1.



Retrograde strangulation of intestine; triple strangulation through one aperture. The omentum is seen passing into the sac which is above the umbilicus.

A similar case is worthy of notice.

The patient, housewife, aged 50, was of an extremely stout habitus, and suffered for 12 months before the date of her operation with an umbilical hernia, of a large size, for which she wore a belt. She was sent to me by Dr. William Thompson, of Waltham Abbey, on April 2nd, 1912, as a case of strangulated umbilical hernia; the history being that the rupture could be replaced until 36 hours before, but, leaving off her belt casually and going to stool, it became fixed externally, this immobility coinciding with the onset of the usual symptoms of acute intestinal obstruction. She continued at

her household duties after descent of the hernia and did a hard day by the wash-tub. On admission this history was confirmed, and the patient, whose general condition was feeble, was prepared for immediate operation. She had a hard swelling above the umbilicus as large as the head of a two-year-old child, hanging downwards from a pedicle and overlying and concealing the natural umbilical scar. The abdomen was opened and the sac exposed and found to be jet black in colour with gangrene; on its incision sanious ill-smelling fluid escaped, while imprisoned inside the mass, and covered by a false sac of sloughing omentum, was found a dilated portion of dead small intestine arranged in groups partly glued together. The constriction was fibrous and extremely tight, situated above the infantile position of the umbilicus, and on section the strangulated gut was pulled down, as a routine measure to inspect the effect of the annular pressure on the coats of the imprisoned neck. Two loops had been incarcerated outside: as a consequence the intermediate part between them was pulled down for examination and was found to be gangrenous and decomposing. (See Fig. 1.) The total gangrenous portion involved, to the extent of three feet, was resected; the general state of the patient being critical, anastomosis was not attempted, but the cut ends were pulled into the wound instead and fixed there for temporary purposes, creating an artificial fistula. (See Fig. 2.) In the evening the patient was much relieved and free from discomfort, while intestinal contents poured freely from that end of the intestine which was physiologically uppermost. Convalescence, in fact, appeared to set in, and I was lured into the hope that success might follow; but this was of a temporary nature, as on the eighth day after operation the patient died. No post mortem was done.

FIG. 2.

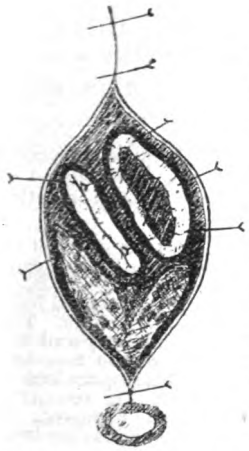


Diagram of parts after operation. The cut ends of bowel are stitched together and to the wound, the lower part of which is packed with gauze.

Pringle [3] records three cases:—

1. Male, aged 27, large scrotal hernia of six years' duration, two loops strangulated externally.

2. Male, aged 55, right inguinal hernia of 14 years' duration, two loops external and irreducible.

3. Male, aged 38, scrotal hernia of 14 years' duration, with three external loops, one normal, one partially strangulated, and one completely strangulated.

This last astonishing case had thus six necks of constriction, and five loops nipped, three external and two internal intermediate connexions, all resulting from one pressure-ring.

Macewen [4] operated on a man with an old-standing mass in the femoral region, attributed to tumour formation, who later developed an increase in the size of the swelling with signs of obstruction. Operation showed an old hernia, non-strangulated, with another recently nipped loop of bowel by its side. The immunity from constriction of the old hernia was due to the thickness of the bowel wall, which, accompanied by masses of "livery" omentum, was possibly a resultant hypertrophy from continued hyperæmia.

Another case was that of a man, aged 26, with a large right inguinal hernia of four years' duration. Lauenstein [5] has the greatest experience of these cases. His interest was first drawn to a patient showing "artificial anus with four lumina," since observing which he has drawn attention to other conditions of a similar nature. The following signs are formulated by him as an aid to diagnosis: 1. The hernia is usually right-sided, scrotal, and of long duration. 2. There may be evidences dependent on a distended condition of the internal loop—e.g., a marked asymmetry in the lower part of the abdomen. 3. There may be a furrowing of the scrotal tumour, with a difference in percussion note over two parts, if one loop contains air, the other fluid.

In my own case here recorded there is an absence of all these points set out by Lauenstein. There was a triple strangulation through the one ring at the umbilicus, two externally and one internally, typical of the condition described by Madyl and Benno Schmidt. The most treacherous cases are those in which no protruded saccular loops are badly nipped, the cœlomic loop alone being affected; the lesson is, of course, that in every operation for hernia the part compressed must be drawn out and *visually* examined, not only to see the condition of that portion so tightly gripped, but also to inspect the inner loops, if present, as to their vitality. The external double-loop strangulation or protrusion itself is of interest, but hardly more than as a surgical curiosity; the resultant inner or retrograde strangulation, be the part originally in the abdomen or be it a second hernia back to the abdomen from the external sac, is of truly vital interest, as if left unrecognised it may cause unaccountable death in cases where loops are casually returned and a radical cure performed without suspicion of the danger which lurks behind. Therefore every case reported will be of value in authenticating a serious disease.

References.—1. L. Laroyenne: Gazette des Hôpitaux, February, 1907. 2. Spencer Mort: Glasgow Med. Jour., April, 1907. 3. J. Hogarth Pringle: Edin. Med. Jour., June, 1906. 4. John A. C. Macewen: Brit. Med. Jour., April, 1910; also ibid., October, 1913. 5. Carl Lauenstein: Arch. f. klin. Chir., 1894; also Deut.-Zeit. f. Chir., 1905; ibid., 1909.

THE TREATMENT OF VARICOCELE BY EXCISION.

BY PHILIP TURNER, M.S. LOND., F.R.C.S. ENG.,
MAJOR, R.A.M.C., T.C.

THE result of the operation for varicocele is by no means always perfectly satisfactory. This has been brought to notice particularly during the war when the operation has been most usually performed on recruits, or on soldiers who have gone sick with this trouble as the result of the strain of service. In these men rapid convalescence and complete recovery are of the greatest importance, while slow convalescence and a persistence of symptoms are a disappointment to the operator who hoped that the men would soon be fit for full duty. Quite apart from the question of neurosis, which certainly does exist in a certain proportion of cases, it is quite common to find a good deal of pain and tenderness persist, often associated with the scar and the induration beneath it where the veins have been ligatured and the divided ends of the varicocele have been tied together.

The usual indication for the operation is the existence of pain and aching, either continuous and persistent or brought on by excessive exertion or by riding, and when the symptoms are only imperfectly relieved by wearing a suspensory bandage. These symptoms are due in part to the dilated plexus of veins and in part to the low position of the testicle, the importance of the latter being shown by the relief often given by the mechanical support of the bandage. The object of the operation should thus be twofold—(*a*) to remove the dilated plexus of veins, and (*b*) to raise the testicle to a higher level and give it better support.

The operation of excision of a varicocele is usually performed in the following manner. The spermatic cord is exposed just below the external abdominal ring; the veins, after division of their fascial covering, are separated from the vas, a few being allowed to remain with this structure. By drawing the cord at first in an upward direction and then downwards the dilated pampiniform plexus is separated as low down as the tunica vaginalis and as high as thought desirable. After ligatures have been securely placed above and below, the intervening mass of dilated veins is cut away, and then, with a view to permanently shortening the spermatic cord and raising the position of the testicle, the ends of the ligatures which have been left long are knotted together, approximating the divided stumps of the veins.

The operation as thus performed certainly fulfils the first of the above-mentioned conditions, but it quite fails to carry out the second. The testicle is not normally suspended by the spermatic cord nor by the pampiniform plexus, neither does its position depend upon the length of the cord. Both suspension and position depend upon the fascial sheath of the cord, composed of cremasteric, intercolumnar, and infundibuliform fascia intimately blended together, which has definite attachments above and is continued below around the parietal part of the tunica vaginalis. The important part played by the sheath in the suspension of the testicle is shown by the action of the cremaster muscle.

The following sequelæ may be the result of the unnatural support given to the testicle by tying together the divided stumps of the dilated veins.

1. There is a "callus-like" inflammatory thickening around the junction of the divided ends. This is often painful and tender and these symptoms may persist for a long time.

2. The inflammatory mass which is formed around the divided veins may become adherent to and incorporated with the surrounding tissue, impeding the free mobility of the testicle.

3. The amount of inflammation may be excessive and suppuration may occur.

4. Generally speaking, the length of the venous plexus which should be excised is greater than the elevation of the testicle which is called for. Thus it is desirable usually to remove three inches or more of the veins, while the testicle should be raised about an inch or an inch and a half at the most. The testicle may thus be unduly raised and its mobility at the same time impaired.

Recently I have endeavoured to overcome these disadvantages by excising the varicocele without joining the divided ends of the veins and procuring increased support to the testicle and raising it to a higher level by shortening the fascial sheath. Various methods of effecting this have been tried. At first I excised portions of the sheath and united the divided ends by sutures or ligatures, but the inflammatory thickening still made its appearance. Lately I have employed the method below which has proved very satisfactory.

The spermatic cord is exposed by the usual incision just below the external abdominal ring; the cord enclosed in its fascial covering is then freed and drawn out of the wound. With a knife or a sharp pair of scissors a longitudinal incision an inch or an inch and a half in length is made through the fascial coverings in front until the veins are exposed. The middle of the incision is secured on each side by a pair of Spencer Wells forceps, which act as retractors. With a blunt dissector the veins are separated from the sheath on each side until the vas, which is situated behind and is more closely connected with the sheath, is reached. The anterior three-fourths or so of the venous plexus, including all the dilated veins, are then separated, leaving the remaining veins with the vas, which is not touched and is not separated from the sheath. The anterior mass of veins is now drawn downwards and a little dissection frees them as high as is thought desirable. Next they are drawn upwards and the separation can now be effected as low as the top of the tunica vaginalis. The separated group of veins is now ligatured above and below and the intervening part is cut away. The ends of both the ligatures are cut short and the testicle is replaced in the scrotum. The sheath is now shortened by retracting the lateral margins of the longitudinal incision and closing this by a fine continuous catgut suture in the transverse direction. It is well first of all to approximate the upper and lower angles of the incision with forceps and to observe what effect this has on the position of the testicle. As a rule, it raises it to a slightly higher level than the testicle of the other side, but if further elevation is considered desirable the length of the original incision can be increased. All bleeding points are then secured, and the wound is closed in the usual way. The great advantage of this operation is that the opening in the sheath is completely closed, and hence the cord and the divided veins do not become adherent to the surrounding tissue. The tender inflammatory nodule around the site of the operation is absent or only very slightly marked, while the testicle remains suspended in a normal manner in the scrotum at a higher level with its mobility unimpaired. I have now operated on six cases at No. 3 General Hospital in this way, and although they are too recent to enable one to speak of the ultimate result, their convalescence has been more rapid and there has been much less pain and fewer after-symptoms than with the ordinary operation. With a little practice the operation thus performed is just as simple and as easily carried out as the ordinary operation and it has the advantage of being much neater.

V.A.D. HOSPITALS.—Totnes, Devon, has had the "Strathmore V.A.D. Hospital" for the past two and a half years. It contains 22 beds, but recently it has been felt that a larger institution was required, and consequently Follaton House, Totnes, has been opened as a V.A.D. hospital with accommodation for 50 beds. Dr. Walter Chapman is the medical officer in charge.—Maxstoke Castle, Warwickshire, which was built in 1345, has been lent to the British Red Cross Society by the Rev. and Mrs. D. L. Lee-Elliott as an auxiliary hospital for convalescent soldiers. It will accommodate 30 patients with the necessary V.A.D. staff.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF GUNSHOT WOUNDS OF FACE AND THIGHS; ŒDEMA OF GLOTTIS; DEATH UNDER NITROUS OXIDE ANÆSTHESIA.

BY G. H. COLT, M.B., B.C. CAMB., F.R.C.S. ENG.,
TEMPORARY MAJOR, R.A.M.C. (T.)

THE following case is worth recording because the occurrence of acute œdema of the glottis, after a small wound of the face, has not been brought prominently before the notice of surgeons since the war began.

Private F., aged 33, was wounded by splinters of shell on Jan. 29th in the upper part of the posterior surface of each thigh and in the right side of the face. Two days later chloroform was administered, and the sloughs removed from the, relatively speaking, small wounds of the thighs. The anæsthetic was administered without any difficulty and the operation lasted 30 minutes. The wound of the face had scabbed over, and in fact the condition in this respect looked so insignificant that it was nearly left alone. On removing the scab a small piece of metal was felt and removed. It was about three-sixteenths of an inch square and larger than the scab. The cavity containing it was gently curetted and a tube inserted. This wound, which led to the death of the patient five days later, was situated half an inch in front of, and half an inch below the level of, the tragus of the right ear. It admitted a small curette to a depth of three-quarters of an inch. No bare bone could be felt. It contained no cloth. It did not communicate with the mouth. No bacteriological examination was made of the interior. For three days all went on satisfactorily, but on the fourth day, six days after the patient had been wounded, the right side of the face was slightly more swollen than it was on the preceding day and a fomentation was applied. In the evening the swelling showed also in the neck and the temperature rose to 102° F. On the morning of the seventh day after the patient had been wounded there was marked œdema of the eyelids on the right side and the patient complained of pain in swallowing. On examination the fauces were seen to be congested and slightly swollen, especially on the right side. At this stage it did not occur to us to examine the larynx; the matter looked simple enough, the swelling of the face and neck being due to insufficient drainage from the abscess. In point of fact two of us well used to anæsthetic work had independently noticed that there was slight respiratory obstruction; both of us had discounted it as being due to the swelling pressing on the right side of the pharynx, and both of us had mentioned the fact to the anæsthetist.

Nitrous oxide gas was administered by the non-rebreathing-valve method. After six inhalations the patient became blue, the administration was stopped, the mouth was opened and the tongue drawn forwards, and two fingers inserted down to the epiglottis and separated. Hewitt's artificial airway was introduced; respiration continued, evidently with considerable obstruction, for about 30 seconds. Spasmodic inspirations followed at intervals of about 20 seconds for something like two minutes, a small amount of air entering and leaving the airway. This made me hesitate to perform laryngotomy, although if such had been done at this stage life would probably have been preserved. Liquor strychninæ ᵐ xxx. was given hypodermically in the pectoral region, the phrenics were faradised and hot cloths applied to the chest. No pulse could be felt in the wrist, but the heart was beating feebly. About five minutes from the start laryngotomy was performed and air then entered freely. Fifteen minutes from the start an incision was made into the abdomen through the upper part of the left rectus and the heart massaged bimanually, this and artificial respiration being continued for 35 minutes. The patient having shown no sign of life for half an hour they were discontinued.

Post mortem there was œdema of the fauces and glottis extending down as far as the upper border of the true vocal cords and on the right side involving also the posterior part of the true cord. The œdema was more marked on the right side than on the left and could be traced to the upper part of the right side of the soft palate near the wound. The uvula was œdematous. The rest of the organs, with the exception of the spleen, which was somewhat enlarged, were healthy and normal. The thymus was not enlarged.

It seems to me that an immediate laryngotomy following on the onset of obstruction to breathing would have saved

this patient's life for the time being, and that it was the only course to have adopted. Laryngotomy is undoubtedly the operation of choice in such a case, for one only requires for its performance a knife and a pair of sharp-pointed scissors, or even a knife alone. The operation seldom takes longer than 20 seconds to perform. The method of drawing forward the skin and transfixing it transversely with the knife, whereby the vessels on the crico-thyroid membrane are left behind uninjured, deserves to be more widely known than it is. The membrane being perforated with the points of the scissors and their blades being then separated the vessels are pressed to each side and hæmorrhage is reduced to a minimum. In the case of a patient with a short, thick, congested neck, for instance a child who has tried to drink hot water from a kettle, this absence of bleeding is a great help. In the case referred to it is probable that laryngotomy would have been needed in a short space of time whether an anæsthetic had been given or not, in fact, the next time that the patient fell asleep.

Particular attention should be drawn to the danger of the onset of œdema of the glottis following a wound in the parotid region. Such œdema is well known to occur in cases of facial anthrax, especially when the pustule is situated near the angle of the jaw, and in cases of wounds of the mucous membrane, notably after extraction of an impacted and septic wisdom-tooth. Not having access at the present time to the literature of the subject I cannot state the relative frequency of its occurrence in these conditions.

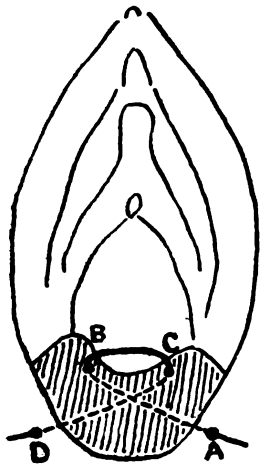
The proposed operation which was the immediate precursor of death could have been efficiently and quickly performed without any anæsthetic, but this would have been a painful proceeding.

METHOD OF SUTURING RUPTURED PERINEUM.

BY W. H. BISHOP, M.B., B.S. DURH.

I HAVE long been dissatisfied with the ordinary method of dealing with the perineum when ruptured during labour. The following plan is probably not new, but I have never seen or heard it described, nor have I met with anyone who has used it.

I use a handled needle, such as Spencer's, or Liston's No. 3 (which is excellent), enter it unthreaded through the skin at middle of left side of tear and about ¼ inch from its edge (see Figure, A) and pass it diagonally across the wound and bring the point out just inside the mucous membrane at centre of vaginal wound (B). It is then threaded and withdrawn and drawn off the suture, leaving this projecting from A and B. I now enter it on the other side in a precisely similar manner (at D), using my left hand, and bring it out at point C. The loose end of the suture hanging from B is now threaded and drawn through, making a figure-of-eight loop when the suture is tied. The vaginal loop is first drawn tight and the ends are tied over the skin. Examining now, the perineum is found to be firmly restored, and this can be further demonstrated by leaving the placenta unexpressed till this stage, when it can be so removed without any opening of the wound or forcing of blood through it. Should the tear extend into the rectum a precisely similar suture could be employed posteriorly, but I have not had the opportunity of using it. I consider it better to bury the suture completely, but it can be made to emerge as it crosses the bottom of the wound if preferred, as in the later operation for the repair of an unhealed rupture.



The shaded portion indicates the rupture.

I use catgut No. 3 for the suture. But silkworm-gut could be used and the difficulty of removal overcome by piercing the mucous membrane in the same way as the skin and so leaving the suture exposed in the vagina, great care being necessary to avoid inverting the mucous membrane when tying. This would be divided and withdrawn preferably 24 hours later. The absorbable material is to be preferred, and there are plenty of reliable brands on the market, and many reliable ways of efficiently sterilising it for oneself.

Reviews and Notices of Books.

BOOKS ABOUT THE WAR.

IT is pathetic that many of the books now appearing, and dealing with different phases of the war, should be occupied with the descriptions of the care of the wounded; in a rough way this is an indication of the terrible loss of life and health that the war now means to us, and of the very general way in which these tragedies are distributed through all ranks of our society.

Wounded and a Prisoner of War. By AN EXCHANGED OFFICER. London and Edinburgh: William Blackwood and Sons. 1916 Pp. 316. 5*s.*—This is a narrative of the experiences of an officer who reached France in the second week in August, 1914, fought in the front trench at Mons, was wounded and taken prisoner at Caudry, was nursed back to life by French doctors and nurses at Cambrai—already, of course, in German possession—was sent to Würzburg as a prisoner at the beginning of the following year, and was finally remitted to England in exchange for a German prisoner. It is a studiously simple story and gains in vividness thereby; the odious inhumanity of the Germans to our prisoners, their cowardly desertion of the sick in the prisoners' camps, their brutality to the wretched inhabitants of the occupied towns all emerge as convincing facts from this unpretentious tale.——From the same publishers is issued *The Tale of a Casualty Clearing Station* (pp. 306, 5*s.* net), by A ROYAL FIELD LEECH, a neatly informatory account of a Lospital unit, which accompanied as near the front as possible the British Expeditionary Force at the outset of war. The personnel, with outfit "accurate to the last safety-pin," embarked at Southampton on Aug. 16th, 1914, and went to Havre and thence to Rouen by water, being the first Englishmen since the reign of Henry V. to see that stretch of the Seine from the deck of a military transport. The Mons retreat and the formation of the 1915 front, and the advance on Neuve Chapelle are the sections of the war described, and always described from the point of view of a casualty clearing station. This book is a pleasant and practical note for the medical history of the war.

A Doctor's Diary in Damaraland. By H. F. B. WALKER, M.D., late Captain, R.A.M.C. London: Edward Arnold. 1917. Pp. 207. 7*s.* 6*d.* net.—This is the story of a mounted Brigade Field Ambulance which accompanied General Botha's force into Damaraland early in 1915. Dr. Walker has an observant eye and a skilled pen, and the value of his book lies not in his description of military events—it was his usual rôle to be toiling a long way in the rear of his brigade—but in his attention to the geographical details, which influenced so strongly an extraordinary campaign. Neither the text nor the pictures make the late German colony a very pleasant place, and life in either Swakopmund, Windhuk, or Lüderitzbucht must have been bereft of every amenity.

The prevailing note of Captain Viaud's book (*War.* By PIERRE LOTI. Translated from the French by MARJORIE LAURIE. London: T. Werner Laurie. 1917. Pp. 228. 2*s.* 6*d.* net) is one of horror at German barbarity and sympathy with its tortured victims. Loti's style comes out even in translation, suggesting that the rendering of Miss Laurie is a faithful one; and this series of pictures, which bear dates between August, 1914, and April, 1916, has all the clearness and sentimental grace expected from the author of "Aziyadé" and "Madame Chrysanthème." By the side of such passages as the description of Rheims and of the exploits of the French Naval Brigade the denunciations of the Kaiser read fustian. But Loti is known to be a good hater. In those days when France and England were on the edge of mutual misunderstanding he wrote a book about India without mentioning England, and this was not meant as a compliment to us. We are reminded of this fact by Madame Alexinsky's interesting account of Russian medical organisation in the early days of the war (*With the Russian Wounded.* By Madame TATIANA ALEXINSKY. London: T. Fisher Unwin. 1917. Pp. 180. 2*s.* 6*d.*). The total omission of reference to the British share in the war has been due to the natural fact that the Russian general population can never mention in conversation a country of which they know nothing. In this connexion her husband, in a prefatory note, makes this witty comment: "Russia is an Elephant, while England is a Whale, so that they have few opportunities of meeting and making each other's acquaintance.

But now that the British Whale has made itself feet of steel and is using them to surmount the blood-stained heights of the Somme ..... you may be sure our people will appreciate our noble Ally." Madame Alexinsky's letters describe the passage of a huge hospital train, wherein she had charge of six *tieploushkas* (wagons improvised to carry tiers of cot cases), full of seriously wounded cases, up and down Russia, between the actual trenches, as at the river San, to Petrograd, Moscow, Brest-Litovsk, Warsaw, and Smolensk, and the incidents are depicted with obvious sincerity. They bring before us in striking manner intimate phases of Russian life during the war, and the sufferings and strenuous determination of the country at large to fight to a finish against German tyranny. The book ends sadly with the beginning of the great Russian retreat, but Madame Alexinsky, a prominent Socialist, will find in the recent revolution in her country grounds for hope that the tide of success will soon flow westward.

An accurate impression of life under the hospital organisation which has sprung into such colossal being during the past two years is given in *The Wards in War Time* by A RED CROSS PRO. (London and Edinburgh: William Blackwood and Sons. 1916. Pp. 343. 5*s*. net.) The book is divided into two parts, the first, and, of course, far the longer, dealing with the military hospital proper, and the second with the auxiliary hospital; in both the routine is displayed to us very clearly with many humorous and discriminating character sketches of a hospital population from top to bottom. "Red Cross Pro" has just the equipment and temperament as a writer to do artistically the task he has set himself; his imaginary types live, move, and have their being for our better information.——A little book with somewhat similar outlook directed towards a French hospital (*Letters from a French Hospital*. ANON. London: Constable and Co., Limited. 1917. Pp. 96. 2*s*. net) is far less ambitious. It consists of a series of letters from a niece who is nursing in France to an uncle at home in England, and many of them were not written deliberately for publication. We agree with the uncle, however, who has decided to issue them, that they merit attention, for they show in a life-like way how active many Englishwomen have been moved to be in their attempts to alleviate the sufferings of outraged France. And more, the author of the verses "La Maison de ——" is a real poet both in sentiment and technique.——*Outposts of Mercy*. By E. V. LUCAS. London: Methuen and Co. 1917. Pp. 60. 1*s*. net.—This record of a visit to the various units of the British Red Cross in Italy gives a striking account of the geographical and climatic difficulties with which the Italian army has had to contend. Mr. Lucas made a tour of the Italian front, comprising the Carso, Gorizia, and the Carnic and Julian Alps, and brief though the form may be which his evidence has taken, he proves to us at home how thoroughly our representatives abroad are upholding the national traditions for helpfulness and kindliness. The notes have a humorous as well as a graphic quality. Exactly the same may be said for Miss Spearing's record of the experiences of a V.A.D. (*From Cambridge to Camiers under the Red Cross*. By E. M. SPEARING. Cambridge: W. Heffer and Sons. 1917. Pp. 87. 2*s*. net). Miss Spearing describes how in November, 1914 the university city, already bereft of most of its undergraduates and many of its dons, began to receive wounded Belgians from the early battle fronts. A year later she was sent to Camiers, and thence to other centres in France, and at each place she has gathered reminiscences which she imparts in a charming personal style. The episodes are sometimes pathetic, sometimes funny, and sometimes both, and we feel that Miss Spearing herself lived through her experience half in tears, half in laughter, but always practical and busy.

Hospital Days. By PLATOON COMMANDER. London: T. Fisher Unwin. 1917. Pp. 188. 2*s*. 6*d*. net.—The author has already made his mark in a previous work, "With My Regiment." We thank him sincerely for his graphic testimony to the energy, utility, and self-sacrifice of the doctors at the front, the theme of the most serious chapter in a collection of good things.——*Regimental Silhouettes*, by CHARLES GRIBBLE (London: T. Werner Laurie, Limited. 1917. Pp. 88. 1*s*. net), has a title well describing its contents. The sketch of the regimental medical officer is kind but very goody goody.—— Dr. Cook has a rather uncertain muse. (*The Happy Warrior and Other Poems*. By AUGUSTUS H. COOK, M.B. London: G. Bell and Sons, Limited. 1917. Pp. 85. 2*s*. net.) There are fine thoughts and poetic expressions scattered up and down his verses, and the technique is conscientious which is all the more laudable, as he has a tendency to use the lilting measures not employed by our rising school of poets. The last piece in the booklet, describing the ideal nurse, is quite happy.

Two excellent translations from the French, both of books dealing with the early phases of the war, have been recently issued. The first of these—*The Diary of a French Private, 1914-1915*. By GASTON RIOU. Translated by EDEN and CEDAR PAUL. (London: George Allen and Unwin, Limited. 1917. Pp. 315. 5*s*. net)—is an important work. M. Gaston Riou is a leader of young French thought and a devout Christian democrat, whose volume entitled "*Aux Écoutes de la France qui Vient*," has expressed to a wide audience the ideals of a group of the finest Frenchmen of the present generation. Having an intimate knowledge of German life and the German language, he received during the year's imprisonment imposed on him at Ingolstadt, despite the fact that he was a Red Cross official, valuable and intimate impressions of how the German people regard the war. He shows how the young German intellectuals, professing the same noble and sometimes religious aspirations as his own school of thought, fell willing victims to Prussian schemes of national aggrandisement, even though their loathing for the political system, which vested autocracy in illiberal leaders, might be expressed in language as uncompromising as any that a Russian patriot could employ. This simple record of the life of a war prisoner in Bavaria is a work of art, so convincingly are the details of a terrible monotony infused with high thinking and brought out by admirable writing, and so glowing is the love of France that burns in the writer's soul.——*Battles and Bivouacs: A French Soldier's Note-book*. By JACQUES ROUJON. Translated by FRED ROTHWELL. London: George Allen and Unwin, Limited. 1917. Pp. 256. 5*s*. net.—This book is also well worth reading. It gives the impression of a totally different young Frenchman, a brave unheeding simple soldier, caring nothing for ultimate causes and determined only to fight, suffer, and die for France. M. Riou and M. Roujon have little in common save their patriotism, but by that link alone they must love one another. This recital of the first six months of warfare demands attention by the vivid and minute way in which it describes the sensations of a young soldier and the episodes in a life of furious fighting.

We include in the literature of war such pamphlets as Mr. Lansbury's moving call to the nation to deal with labour questions on Christian principles, and Mr. Ashbee's exposition of the views of the United States on the questions of national armaments and industrial ethics (*The American League to Enforce Peace, an English Interpretation*. By C. R. ASHBEE. 1917. Pp. 92. 2*s*. 6*d*. net, and *Your Part in Poverty*. By GEORGE LANSBURY. 1917. Pp. 126. 1*s*. net. Both London: George Allen and Unwin), for in each case the social conditions brought about or accentuated by the war are under consideration, and the intention of the writers is to urge the world to ensure a general amelioration of them. Both writers are speaking for industrial democracy in the same spirit, and with the same faith in the good sense of the people at large. There is nothing medical about the arguments put forward by either, but sincerely humanitarian ideals will always have the support of the majority of medical men, to whom the miseries and muddles of social life are necessarily revealed with particular clearness.

JOURNALS AND MAGAZINES.

Archives Médicales Belges. Editorial Committee: MM. Brachet, Debaisieux, de Marneffe, Denhaene, Depage, Derache, Gaudy, Hainaut, Henrard, Labasse, Maistriau, Nolf, Renaux, and Willems; Secretaries: M. Stassen and J. Voncken. Seventieth year. Nos. 1, 2, and 3, January, February, and March, 1917. Pp. 1-288. Price, annually, non-occupied Belgium and France, 16 fr.; abroad, 18 fr.; monthly number, 1 fr. 50; Paris: Librairie J. B. Baillière et Fils, 19, Rue Hautefeuille.—The publication of this monthly journal has been resumed after two years' abeyance owing to the war. The journal is open not only to communications dealing with war medicine and surgery but to all medical, scientific, and social work. With reference to social work, the editorial committee's programme contains the following words: "La médecine sociale n'occupait pas encore en Belgique la place qui lui était due; le retour au temps de paix montrera combien elle était indispensable et combien les réformes qu'elle suscitera aménéront un mieux-être de notre peuple."—The January number contains articles by Dr. P.

Derache on Wounds of the Knee-joint from Projectiles; by Dr. E. Renaux on the Malarial Fever of Flanders; and by Dr. René Sand on Social Medicine in England. Following these comes a résumé of the lesions of peripheral nerves in the war and reviews of European and American medical and scientific journals, concluding with a short account of the origin and position of the Belgian Doctors' and Pharmacists' Relief Fund. —The February number contains articles by Dr. P. Nolf on Injections of Peptone in the Treatment of Typhoid Fever and other infectious conditions; Dr. L. Wilmaers and Dr. Renaux on 47 cases of Ictero-Hæmorrhagic Spirochætosis; and Dr. Henrard on Localisation of Foreign Bodies, with numerous diagrams.—In the March number Dr. Stassen discusses the professional re-education of those mutilated by the war. We congratulate the promoters on the resuscitation of the archives.

Journal of Anatomy.—Part II. of this reorganised periodical fulfils in every way the expectations that have been formed for the future of the organ of the Anatomical Society. The papers published in this issue cover a wide range of anatomical subjects, deal with problems of sufficient importance to render them permanently valuable, and have entailed in their composition more research than is involved in the mere recording of a dissecting-room anomaly.—A timely contribution is that by Professor M. Boule and Professor R. Anthony, which deals with the interpretation of the endocranial casts of fossil man. The authors give sound reasons for supposing that those who have discarded such interpretations as highly speculative and fallacious have gone a good deal too far; and they adopt the logical standpoint that positive evidence, when it is available, should not be discredited because in other cases positive evidence is not to be obtained. No form of investigation should be neglected in the study of the fragmentary remains of earliest man, and to disparage research, because in some cases that research can only produce negative results, is poor service to science.—A paper which contains a valuable summary of the condition of the branchial arteries in reptiles is that by Dr. Charles H. O'Donoghue, and the utility of the contribution is enhanced by the timely effort made to define rigidly that channel to which the term "ductus Botalli" is rightly applied.—Professor T. H. Bryce and Dr. Matthew Young give the detailed results of their observations on metopism. The work was carried out on a long series of West Scottish skulls preserved in the anatomical department of the University of Glasgow, and the findings furnish a valuable and permanent contribution to the literature of physical anthropology.—The same may be said of Dr. W. L. H. Duckworth's notes on measurements made on subjects in the dissecting-room. The author attempts to correlate head measurements and skull measurements, a research which might well be carried on in other anatomical departments. —Dr. R. H. Robbins contributes a paper on the human pisiform; the study constitutes a preliminary to a more extended communication on the comparative anatomy of this bone.—Another paper is added by Professor F. Wood Jones to the series dealing with the comparative anatomy of the genitalia; in the present communication the reproductive system of the tree shrew (*Tupaia*) is described and illustrated.—Two papers which hold rich possibilities of useful surgical application are those by Mr. V. Zachary Cope on the sphenoidal air sinus, and Mr. Alwyne T. Compton on the intrinsic anatomy of the sciatic nerve trunk.

The *Cornhill Magazine* for May contains, in an article by Mr. Lewis R. Freeman, on the work of the British Red Cross and Order of St. John, Italy, an amazing story of resourcefulness on the part of an ambulance driver:—

> One of the voluntary drivers was bringing down, over an especially difficult piece of road, an ambulance full of wounded from a lofty sector of the Alpine front, when he encountered a soldier in a desperate condition from a gaping bullet-wound in the throat. "Realising that the man was in imminent danger of bleeding to death, the driver lifted the inert body to his seat, propping it up the best he could next to where he sat behind his steering-wheel. Driving with his right hand, while with a finger of his left he maintained a firm pressure on the severed carotid artery, he steered his ambulancee down the slippery, winding mountain road to the clearing station at the foot of the pass. The laconic comment of the astonished, but highly pleased Italian doctor on the incident was direct but comprehensive. "Well, young man," he said, as he took hasty measures further to staunch the gushes of blood, "you've saved his life, but in five minutes more you would have throttled him."

Owing to the amalgamation of the famous publishing house of Smith, Elder, and Co. with the no less famous house of John Murray the *Cornhill Magazine* has been transferred to the latter firm.

Reports and Analytical Records
FROM
THE LANCET LABORATORY.

CRYOGENINE (LUMIÈRE).

(THE ANGLO-FRENCH DRUG COMPANY, LIMITED, GAMAGE BUILDING, HOLBORN, LONDON, E.C.)

As an antipyretic and analgesic cryogenine has been known for some time, but now that certain restrictions have been placed on the supply of phenacetin further attention to its therapeutic properties may be given. Chemically it is a benzoic acid derivative and is known as meta-benzamidosemicarbazide. It is a white crystalline powder freely soluble in ether, chloroform, and benzene, and to the extent of about 1 per cent. in water at 20° C. It has a marked reducing action which is strikingly shown with Fehling's solution. The blue colour is reduced in the cold to green, and on heating the fluid a rapid reduction to red cuprous oxide occurs. This reaction readily enables the detection of the drug when it is eliminated in a non-diabetic or non-glycosuric urine. Clinical experiments are quoted showing its value in reducing pyrexia and in diminishing pain, particularly in neuralgia and rheumatism. These effects are said to be unattended with secondary phenomena. Its administration leads to a strong yellow tint in the urine not referable to biliary pigment, but due to oxidation of the drug itself.

VAPOROLE CHLOROFORM.

(BURROUGHS, WELLCOME, AND CO., SNOW-HILL BUILDINGS, LONDON, E.C.)

These vaporoles, each containing 3 minims of chloroform, may well serve a useful purpose. The chloroform is contained in a thin glass tube wrapped in wool and an outer case of gauze. The tube is easily crushed by pressure between the thumb and finger and chloroform vapour so liberated. The suggestion, for one thing, is that the vapour in this way can be used for the relief of earache (not to be used in suppurating cases). To this end the capsule is broken and placed in a small vessel, such as an egg-cup, which is then held close to the affected ear. It may also be used when inhalation of a small quantity of chloroform vapour affords temporary relief in asthma or croup. This small measurement of chloroform renders its use safe.

TOILET SOAPS.

(PRICE'S PATENT CANDLE CO., LIMITED, BATTERSEA, LONDON, S.W.)

We have examined two specimens of toilet soap recently introduced by this well-known firm under the names respectively of "White Clover" and "Santal." Both proved to be perfectly neutral soaps, giving no evidence whatever of the presence of free alkali. There were, in fact, no extraneous ingredients found at all except perfume, which in the one case ("white clover") was of a light, agreeable, "grassy" character, and in the other ("santal") a heavier perfume of oriental style. The moisture in the former was 10·6 per cent. and the combined alkali 9·3 per cent. (Na_2O); in the latter the moisture was 9·1 per cent. and the combined alkali 9·5 per cent. (Na_2O). Both specimens gave a pleasant and economical lather, perfectly smooth and cleansing to the skin.

BLENOSAN CAPSULES.

(ROBERT FERBER AND CO., 98–104, OAKLEY-STREET, WESTMINSTER BRIDGE-ROAD, LONDON, S.E.)

This combination of the essential resins of kava-kava, the root of *Piper methysticum*, with santal-wood oil is said to be serviceable in relieving pain and the constant desire to micturate in gonorrhœa. Kava-kava is referred to as possessing an anæsthetic action on the urinary passage, and an anaphrodisiac. Blenosan is a clear greenish oil in which the resin of kava-kava is dissolved in santal oil. It is interesting to note that a beverage is made from kava-kava which produces a mild drowsiness in the consumer.

LIQUEUR RUM (MEDICAL RESERVE).

(H. N. GILBEY, 15, 17, 17A, CHARLOTTE-STREET, TOTTENHAM COURT-ROAD, LONDON, W.)

Genuine rum is sharply distinguished from all other ardent spirits by containing a considerably larger amount of volatile ethers. They are probably formed during fermentation by the action of the acids in the sugar on the alcohols. There can

be little doubt that on this account rum is a more rapid and powerful stimulant than the other spirits, and possibly this may be a reason for retaining it for the use, under supervision, of the military and naval services. The analysis of the specimen described above gave the following results:—Alcohol by volume, 40·14 per cent. (equal to 30° under proof); extractives, 0·41 per cent.; mineral matter, 0·15 per cent. The secondary products given in parts per 100,000 parts of alcohol present were as follows: Volatile acidity reckoned as acetic acid, 75·0; ethers, 176; aldehyde, 12·5; furfural, 2·5; higher alcohols, 125. These figures are quite in accordance with those yielded by a genuine old mature rum. The spirit possessed the peculiar characteristics in regard to aroma and taste of genuine rum, and was "round" and smooth to the palate. The ethers occur to about twice the quantity found in genuine Cognac brandy, but show some reduction owing to the dilution now required by the State to a maximum alcoholic strength of 30° below proof.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

SUBSCRIPTIONS.

THE following additional subscriptions to the Fund have been received:—

	£	s.	d.
Dr. Burrowes	1	1	0
Royal College of Physicians of Edinburgh, for the North British Branch of Pharmaceutical Society of Great Britain (per Dr. Norman Walker)—			
Subscriptions in hand, April, 1915	0	15	0
Dr. James Caskie	1	1	0
Mr. R. Hay	0	10	6
Mr. H. Dryerre	1	1	0
Edinburgh District Chemists' Trade Association (per Mr. A. A. Murray)	2	2	0
Mr. W. G. Johnstone	1	1	0
Mr. J. S. B. Heddle	0	10	0
Mr. Alex. Inglis	0	10	0
Dr. G. D. H. Carpenter (24th donation—total £24)	1	0	0

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund crossed Lloyds Bank, Limited.

THE APPEAL FOR SURGICAL INSTRUMENTS.

Surgical instruments should be sent to the Master of the Society of Apothecaries, Apothecaries' Hall, Blackfriars, E.C.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

THE annual meeting of the Governors and General Council of King Edward's Hospital Fund for London, to receive the accounts and the report of the General Council for the year 1916, was held at St. James's Palace on April 27th, the Duke of TECK being in the chair.

Lord REVELSTOKE, honorary treasurer, in presenting the account of receipts and expenditure and the balance-sheet for the year ending Dec. 31st, 1916, said that the Fund had received support enabling it to put a substantial addition to reserve. This addition, which amounted to no less than £143,000, was due mainly to the receipt of £137,000 on account of the residue of the estate of the late Lady Wilton. Since the end of the year a further sum has been received, raising the total of the bequest to £163,000. The net loss on the realisation of investments shown in the balance-sheet was due to a sale of the Fund's holding of American securities, which the Finance Committee had considered it their duty to make in response to the invitation from H.M. Treasury, and the re-investment of the proceeds in British Government securities.

The SPEAKER of the House of Commons moved the adoption of the accounts, which was seconded by Viscount SANDHURST and carried unanimously.

Mr. JOHN G. GRIFFITHS, honorary secretary, presented the draft report of the Council for the year 1916, of which the following is a summary:—

The total receipts for the year 1916 were £326,474 3s. 9d., of which £9447 15s. 5d. were contributions to capital, and £317,026 8s. 4d. receipts on general account, the general fund receipts being made up as follows: Annual subscriptions, £25,403 3s. 6d.; donations, £5837 1s. 5d.; contribution from League of Mercy, £15,000; from the estate of Isabella Countess of Wilton, £137,634 18s. 11d.; from the Lewis estate, £3000; other legacies, £33,418 7s. 8d.; dividends and interest from investments, £96,532 16s. 10d.; from the Trustees of the Bawden Fund, £200. The amount distributed was £170,000, which was £30,000 more than the amount applied to this purpose in 1915, and £12,500 more than the previous maximum appropriation before the war. Of the amount distributed £162,500 were allocated to London hospitals and £7500 to consumption sanatoria and convalescent homes taking London patients, as against £133,500 and £6500 respectively in 1915. Of the £162,500 granted by the Fund to the London hospitals, £128,425 were given in aid of general maintenance, £15,000 to the reduction of debts on maintenance account, and £19,075 toward improvement schemes or in reduction of liabilities on such schemes undertaken before the war. The Fund had continued to encourage the hospitals in the policy of postponing all schemes of capital expenditure not exceptionally urgent or not already in hand at the outbreak of war, and the total grants in aid of new schemes were only £6525. The increase in grants for maintenance over those made in 1915 amounted to £25,900. This large addition to the grants was, however, by no means in excess of the needs of the hospitals. The total sum distributed amongst hospitals, convalescent homes, and consumption sanatoria during the last ten years (after deducting conditional grants to the extent of £6500 that had been allowed to lapse) was £1,544,750. Since the foundation of the Fund a total amount of £2,268,416 had been distributed. The average annual distribution for the whole period of 20 years had been £113,420 16s. 5d. During the year the amount spent on administration was £3161 2s. 3d., or 19s. 4½d. per £100 of the total amount received, as compared with £3205 16s. 1d., or £1 8s. 3d. per £100, last year. The corresponding percentage for the whole period since the inauguration of the Fund had been £1 4s. 3d., or less than 3d. in every £1 received, the average yearly outlay in this respect being £2836 2s. 8d. The League of Mercy this year had contributed £15,000, a larger sum than was received from the League in any of the last three years. The total amount contributed to the Fund by the League of Mercy since its foundation in 1899 now amounted to £245,000, apart from the sums awarded by the League to institutions outside the area of the Fund's distributions. The legacies received during the year included, in addition to the bequest of the late Isabella Countess of Wilton and a further amount of £3000 from the Lewis bequest, £20,193 19s. 5d. from the late Lady Brownlow, widow of Field-Marshal Sir Charles Brownlow; £10,000 given by the executors of the late Mr. Thomas Stephen Whitaker in the exercise of their discretionary powers; and £5000 to capital from the late Rt. Hon. Sir Andrew Richard Scoble.

Viscount IVEAGH moved the adoption of the report, which was seconded by Viscount KNUTSFORD and carried unanimously.

New Inventions.

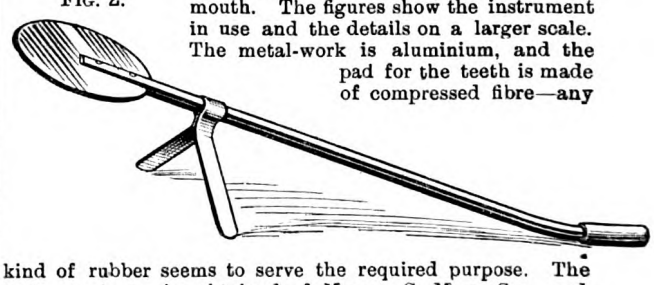
AN INSTRUMENT TO ENABLE ARMLESS MEN TO TURN OVER THE LEAVES OF BOOKS.

ONE of the great difficulties with which men who have lost both hands have to contend, is turning over the leaves of books they may be reading. With the aid of Captain C. G. M. Hatfield of the 18th Middlesex, and Mr. Barker of the Engineering Laboratory, I have devised a small instrument, one end of which is held between the teeth and the other—which is provided with an indiarubber cap—is pressed against the leaf and with a little practice the leaf can be readily turned over. The instrument is raised on two diverging feet so that one end is lifted off the level of the table and can be easily picked up by the mouth. The figures show the instrument in use and the details on a larger scale. The metal-work is aluminium, and the pad for the teeth is made of compressed fibre—any kind of rubber seems to serve the required purpose. The instrument may be obtained of Messrs. S. Maw, Son, and Sons, 7-12, Aldersgate-street, London, E.C. 1. Price 3s. each.

FIG. 1.



FIG. 2.



Christ's College Lodge, Cambridge. A. E. SHIPLEY.

THE LANCET.

LONDON: SATURDAY, MAY 19, 1917.

The Supply of Medical Officers for the Army: Civil and Military Medical Needs.

THE supply of medical officers for the Army has been kept up by the Central Medical War Committee, the Committee of Reference of the English Royal Colleges, and the Scottish Medical Service Emergency Committee, in accordance with the demands of the War Office, and it has been possible to accomplish this by strenuous work on the part of the Executives of those three bodies, in coöperation with Local Medical War Committees which in some districts have worked with great energy and discrimination. The result, moreover, reflects a real desire on the part of the medical profession as a whole to help their country in its need or the efforts of the Committees would have failed in their object. Without going into the exact figures, which would have no particular meaning unless they were considered in connexion with figures which alter from time to time in accordance with the military situation, as well as with the general statistics of the medical profession, we may say that last week the War Office required 250 additional medical officers by a certain date, and that 234 of them were found within two days of that date. Those who know how firmly in many areas the claims of the civilian population have been pressed, and how scrupulously the right or fairness of exemption has been tested in the cases of appeal, must agree that the results of a system based on a voluntary principle, and still working in the thirty-third month of the war, are creditable to the patriotism of medical men as a section of the community.

There is no doubt, however, that the Committees entrusted by statute with the duty of recruiting the members of the medical profession for military services have nearly come to the end of their resources. This has been signified quite plainly to the War Office during the last few days, and must have been common knowledge to the medical profession as a whole, for the local efforts to spare practitioners and to fill the gaps created become more and more strenuous as time goes on and as the War Office needs remain unsatisfied. There are certain areas from which only incomplete returns have been made as yet to the Central Medical War Committee, and there are medical men about whose arrangements the Local Medical Committees are doubtful, and other medical men who, according to these Committees, cannot be spared unless the principle of substitution is put in hand in some large and general way. From these sources a certain number of medical men can still be obtained whose age and qualification are quite in keeping with their acceptance of commissions, but it must not be forgotten that a proportion of these men will certainly be rejected on physical grounds, and it may be that some who still are calculated in the returns as potential officers have already failed to come up to the physical standard. It is also believed that, depleted as the ranks of the men holding whole-time appointments may be, a further contribution can be obtained from them, and in this direction the substitution of women doctors, which has already proved so helpful, may be open to extension. Comprehensive estimation of the whole supply at the disposal of the three Committees shows, therefore, that the material remaining is capable of yielding only a very small number of men, and that the civilian public is already putting up with a marked shortage. This suggests inevitably that unless some difference is made in the methods of employment of the medical men when they have received commissions, some method, that is, which would enable economy to be effected, the public will have to ration itself as rigidly with regard to the ministrations of medicine as they have to with regard to cereal foods. Unfortunately, any real dearth of medical service in a country has a more lasting and worse effect on a population than a period of scarcity of food, for the latter, when remedied, is found to leave a far less lasting effect. The machinery for the distribution of food remains intact and soon returns to normal working, but the machinery for the maintenance of national health cannot be laid aside and suddenly resumed. This being so, it is obvious that we must look anxiously on all sides for economical plans in the employment of our medical personnel. Already most civilian communities are working their hardest to dispense with unnecessary medical aid, and every civilian hospital does, in addition to its ordinary medical work, extraordinary work of a military nature, performing the increased duties with a decreased personnel. Already the medical administration of many public authorities is shorthanded, and, magnificent as the substitution work of the recently qualified women who have taken men's places has been, there is no doubt that much valuable preventive and sanitary organisation has been arrested in its development. Therefore, it is inevitable that we should find the eyes of many fixed on the Army, with the question on their lips whether th military needs cannot in any way be made less by some reforms in the employment of the medical material already supplied.

We have in these columns pointed out over and over again, in reply to ill-considered criticisms of the medical administration of the Army, that local must not be taken as an indication of general conditions. Time after time we have had communications from correspondents saying that at a certain time in a certain place there appeared to be a certain number of medical officers whose work was very light, and that if this was the state of affairs which prevailed throughout the Army, there could be no wonder at a position of shortage being quickly reached. For these critics

the conditions of training and the periods of transition had no being; they saw what lay beneath their eyes and failed to imagine that a supply of medical men can only be forthcoming at a desired spot without delay by placing them more or less in communication with that spot some time beforehand. We would not say that none of these critics was ever right, but it remains a fact that their general message was incorrect. Now, however, the position is somewhat altered. We have been at war for a long time, and the scope of our military activities is far better defined than it was during 1915 and 1916. We occupy a different attitude towards our powerful enemies, the initiative, generally speaking, is with us, our needs can be forecast, and there is not the same necessity to keep idle, against an unexpected demand or a rapidly projected expedition, large medical personnel. Whereas in the early days of the war it was absolutely necessary to leave to the War Office the right to ask whatever men they required from the medical profession, the circumstances are now modified, if only by the response already made by the profession to the War Office. For it must be remembered that some of the best civilian medical brains have been obtained by the Army from the earliest days of the war and a proportion of these officers have been engaged in the work of medical organisation for over two years. They possess what are of necessity largely denied to the regular members of the Royal Army Medical Corps—namely, a knowledge of the conditions of the civilian medical life and a familiarity with the civilian needs. We feel that the inclusion of these men in the Royal Army Medical Corps should make it quite easy for the military authorities to enter into intelligent conference with civilian medicine, and that from such a laying together of heads solid good would be derived. Such matters as the staffing of Voluntary Aid Division hospitals and the employment of medical men in part-time military posts could, we believe, be settled with a real saving of *materiel* by a conference between people equally alive to military and civilian needs.

The Vital Statistics for the First Year of War.

THERE is not yet a Ministry of Health, although in receiving a deputation on infant welfare last week Lord RHONDDA said he was becoming more and more convinced of the need for one, adding a hope that the Ministry, when created, would be largely based on the present Local Government Board. One substantial ground for this need is given by the figures of Sir BERNARD MALLET, the Registrar-General, who has recently issued his report for the year 1915.[1] This report, although dealing with matters 18 months distant, gives information to our profession that has not appeared in any document previously issued from Somerset House. We limit our comments in the main to the salient vital statistics of the year, because the facts of natality and mortality for 1915 have already appeared in the Annual Summary issued in March of the following year. In that publication, however, the facts were derived from returns furnished by the local registrars, whereas the statistics for this report are compiled from the statutory registers and are analysed in considerable detail by experts in the central office.

From the Statistical Section of the Registrar-General's report we learn that the marriage-rate for 1915 was the highest on record; it was equal to 19·5 per 1000 living, and exceeded the average rate in the ten preceding years by 4·1 per 1000. The birth-rate, 22·0 per 1000, was the lowest hitherto recorded, and was in defect of the decennial average by 3·5 per 1000. Nevertheless, the fall in the English birth-rate in the year under notice compares favourably with the experience of other belligerent countries. The civilian death-rate was 15·7 per 1000, and although 1·2 above the average in recent years for the whole population, was yet below this rate in any year before 1903. The rate among civilians is adversely affected (*a*) by the withdrawal for service abroad of a large body of men whose mortality experience is below the average rate at the same ages, and (*b*) by the fact that the men remaining in the civil population at military ages are on the whole less healthy than those who have been withdrawn. Although the standardised mortality of 1915 exceeds the standard of the immediate past, the excess is smaller than might have been anticipated in the circumstances. Apart from the abnormally high death-rate of men of military age who have remained at home, the increase of mortality in 1915 mainly occurred in later childhood and in old age. There is still no provision for the registration of still-births, although, in view of the present dangers to child life, the vital importance of this information was emphasised in 1904 in the report of the Committee on Physical Deterioration. Of the total deaths registered in 1915 in England and Wales almost 16 per cent. were those of infants under the age of one year, corresponding to a mortality of 110 per 1000 births. The immediate chances of survival differ but little at birth in the towns as compared with the country, but the noxious influences of town life speedily appear and make themselves felt increasingly as the first year of life progresses, and to a still greater extent in the second and third years, when the urban excess generally approaches 100 per cent. The fact has, however, been recently brought out by Sir ARTHUR NEWSHOLME in a report on child mortality that the relatively low death-rate in rural districts is attainable under urban conditions by enlightened administrative measures. The mortality during 1915 of illegitimate infants was about twice as high as that of children born in wedlock. Among male infants the excess was highest at ages from one to three months, and among females at ages from three to six months. The mortality of illegitimate infants exceeds that of legitimate infants, more particularly in the case of deaths attributed to syphilis, which are nearly eight times as many. Probably ther is less reluctance to

[1] Seventy-eighth Annual Report of the Registrar-General.

certify the true cause of death in the case of these infants, but the difference is greater than can be explained in this way. Before leaving the subject of infantile mortality it is only fair to point out that the figures given in the returns of medical officers of health for 1916 are almost uniformly lower, in some cases much lower, than those for 1915, and this fall is of particularly good omen, having regard to the circumstances of war in the midst of which it occurred.

Except in the case of scarlet fever, enteric fever, and diarrhœal diseases, most of the principal causes of death showed increased mortality in 1915 as compared with the previous year. The death-rate from enteric fever was the lowest on record, but influenza was more fatal than in any year since 1900, and measles was exceptionally destructive to child life. Another special feature in the year's mortality is the abnormally high death-rate from cerebro-spinal fever, consequent upon the first outbreak in recent years of this very fatal disease. The figures for 1916 and those at present available for 1917 show that this high mortality has not been maintained, especially in regard to the civil population. The mortality atributed to diphtheria and croup in 1915 was practically the same as that of the preceding year, and the rate of both years was heavier than at any time since 1908. In each of the last five years the county boroughs of Northampton and Stoke-on-Trent experienced a diphtheria mortality in excess of that for England and Wales. This fact confirms the statement emphasised in previous reports, that in the tendency to recurrence of high mortality in successive years in the same area diphtheria resembles enteric fever and scarlet fever. The mortality from pulmonary tuberculosis showed a marked increase among males and a slight increase among females, but it must be remembered that the rates for 1915 relate exclusively to the civil population and that enlistment has withdrawn a very large number of healthy males at ages considerably affected by the incidence of tuberculosis. Judged by the ordinary or crude death-rates in 1915, a higher mortality than in any other year was caused by malignant disease, but, in view of the present abnormal constitution of the civilian population, this form of statement is misleading in dealing with such a disease as cancer. When these death-rates are standardised, as they should always be, comparison shows that the mortality of both males and females from this disease was slightly below that of either of the two preceding years. Taken as a whole, and seen in the light of later experience, Sir BERNARD MALLET'S report is an important and vastly interesting chronicle of the first completed year of the war in its effect on the nation's health. The appearance of the report for 1916 will be awaited with impatience, tempered by the fact that a rough comparison is already available from other sources.

CENTENARIANS.—Mrs. Mary Paige died at Rochester on April 24th. She was born near Launceston, Cornwall, on Nov. 2nd, 1815.—Mrs. Mary Shittler died recently at Holwell, near Sherborne, aged 103 years.

Annotations.

"Ne quid nimis."

PUBLIC HEALTH AND THE CONTROL OF THE LIQUOR TRAFFIC.

IN his lecture delivered on Wednesday last at the Royal Institute of Public Health Lord D'Abernon, chairman of the Central Control (Liquor Traffic) Board, dwelt on the curious fact that with one trifling exception the State has hitherto never attempted to regulate the conditions of the liquor trade on grounds of public health. The protection of revenue, the safeguarding of public order, the maintenance of morals, have afforded occasion for restrictive measures, but even the Public Health Acts barely allude to the hygienic dangers of the public-house. He regards this as the more remarkable since the important part which alcohol plays in the causation of suicide and accident, in the diffusion of venereal diseases, in the mortality from many diseases not themselves due to alcohol, and in the production of infantile mortality is an old and familiar fact. Lord D'Abernon went on to show how the policy of reasoned and moderate restriction had already resulted, beyond doubt, in reducing alcoholism, as shown not only by the diminished number of convictions for drunkenness and of deaths from excessive drinking, but also by a corresponding diminution in delirium tremens, which was generally admitted to be an index of less overt forms of intemperance. The latter conclusion he based upon the figures for the cases treated in Liverpool infirmaries for three periods of 12 months each provided him by the Poor-law officials. The issue of the third report of the Central Control Board on May 7th gives the general reader also the opportunity of studying the striking figures in regard to the diminution of convictions for drunkenness in the area under the Board's control. One instance will suffice. In the four weeks immediately preceding the issue of the Control Board's Orders the weekly average of such convictions was 3956; for the same period ending March 25th the average was 1755, or less than one-half the number. Lord D'Abernon's conclusion, therefore, seems a fair one, that intemperance can be diminished in considerable degree by legislative and administrative action. Important, and almost new, as this conclusion is, there remain many problems in relation to the drink question which await solution, and we therefore welcome the appointment of an advisory committee by the Control Board which we foreshadowed in THE LANCET of July 29th last.

The composition of this technical committee was given by Mr. Kellaway, Parliamentary secretary to the Ministry of Munitions, in the House of Commons in answer to a question by Sir W. Collins, viz.: Lord D'Abernon (chairman), Sir G. Newman, Dr. A. R. Cushny, F.R.S., Dr. H. H. Dale, F.R.S., Mr. M. Greenwood, jun., Dr. W. McDougall, F.R.S., Dr. F. W. Mott, F.R.S., Dr. C. S. Sherrington, F.R.S., and Dr. W. C. Sullivan. The terms of reference are as follows: To consider the conditions affecting the physiological action of alcohol, and, more particularly, the effects on health and industrial efficiency produced by the consumption of beverages of various alcoholic strengths, with special reference to the recent Orders of the Central Control Board, and further to plan out and direct such investigations as may appear desirable, with a view to obtaining more exact data on these and cognate questions.

As Lord D'Abernon pointed out on another recent occasion, the problem of drunkenness has become

numerically a smaller one, and it should therefore be now possible to apply more specialised methods in dealing with it. We shall not be wrong in expecting from the technical committee, with its abundant scientific equipment, suggestions for methods which may well solve many of the hygienic problems of the drink question within our own time.

THE LARDER AND THE DUSTBIN.

REGULATIONS affecting the economic management of both the larder and the dustbin have recently been issued by the Local Government Board, and to these special prominence has been given by a prosecution which took place early in the week on account of bread found in the dustbin. In the case of the larder a definite order has been given conferring on local authorities and their officers the powers and duties of enforcing certain provisions set out in a schedule. The Order leaves it to the local authority to arrange as it thinks fit for enforcing these provisions. Any expenses incurred by a local authority in the execution of this Order are to be counted as work carried out under the Public Health Act, 1875, or the Public Health (London) Act, 1891, as the case may be, and defrayed accordingly.

The schedule sets forth that part of the various Orders issued in respect of which the powers and duties are conferred and imposed upon local authorities and their officers. In the cases of the Bread Order, 1917; the Swedes (Prices) Order, 1917; the Food (Conditions of Sale) Order, 1917; the Tea (Nett Weight) Order, 1917; the Public Meals Order, 1917; the Cake and Pastry Order, 1917; the Wheat, Rye, and Rice (Restriction) Order, 1917; and the Maize, Barley, and Oats (Restriction) Order, the local authorities are instructed to carry out the whole of the provisions. In the cases of the Brewers' Sugar Order; the Potatoes, 1916, Main Crop (Prices) Order (No. 2), 1917; the Price of Milk Order, 1917; the Feeding of Game Order, 1917; the Sugar (Confectionery) Order, 1917; and the Manufacture of Flour and Bread Order (No. 2), 1917, only certain clauses of the Order as regards the powers of local authorities come within their exercise.

It is to be hoped that this comprehensive Order will work smoothly, as it can only do if it receives the loyal coöperation of the householder, and is administered by the local authority with fairness and individual consideration.

The immediate removal of household refuse becomes of pressing importance now that the heat of summer has begun to assert itself, and the householder who scents danger to himself and his family from the accumulation of his own waste products should realise that here also his coöperation is essential to a proper safeguarding of the national health. The circular just issued by the Local Government Board to local councils frankly recognises the difficulties under which the removal and disposal of refuse are now carried out by local authorities, and suggests methods of facilitating their work. Householders are encouraged to sift out and burn cinders, to separate kitchen refuse from waste paper, cardboard, and like substances, and to burn either of these if not duly collected. Householders may have to be asked to place their refuse-bins where they can be emptied with least labour. The coöperation between householder and scavenger thus suggested should be undertaken cheerfully by all right-minded men and women. The labour involved will not be great, and if some of the economies resulting from it would have been looked upon as petty in days now bygone they are of real importance now. To burn cinders until they are incapable of producing further heat will help to preserve a coal-supply which is now neither ample nor cheap. Broken cardboard boxes and waste paper used to kindle fires will save wood, the scarcity of which is roughly indicated by its greatly augmented price. That fires can thus be lighted easily, especially in kitchen ranges or where there is a good draught, is probably not realised by many who still look upon "fire-lighters," which consume resin or paraffin unnecessarily, or firewood especially prepared in bundles for the purpose and used with reckless prodigality, as essential to the kindling of coal. To burn all vegetable refuse which cannot be utilised for the feeding of pigs and other domestic animals will be a matter of trouble rather than of difficulty where there are kitchen ranges heated by coal. Where this is not the case a bonfire in the garden will result in ash useful for manure. In town houses where there are no gardens, and where only gas is used in the kitchen, it will not be so easy for the private individual to get rid of organic refuse, although neat and simple gas destructors are specially made for this purpose. The town householder's duty will consist mainly in seeing that as little as possible accumulates, and that this little is kept well protected from flies and under conditions preventing it from offending his family and neighbours until it can be removed.

GENERAL HUMAN CYSTICERCUS INFECTION.

HOWEVER rare and interesting may be a case of human cysticercosis in generalised form and diagnosed during life, the clinical record of such a case would be devoid of real practical and scientific importance if it did not tend to elucidate those details of pathology and symptomatology which have remained hitherto obscure. Dr. Andrea Boccavilla, in reporting such a case (*Il Policlinico*, Medical Section, Feb. 1st, 1917), considers that it merits special consideration both in regard to the nature of the pathological condition caused by the infection, its symptomatology, and the elaboration of the diagnostic methods already known and the eventual acquisition of new ones. The symptoms of the case were instructive as a whole and in connexion with the elective seat of the parasite in man—i.e., muscles and brain. The case exhibited, besides the presence of nodules of cysticercus in the skin, the following prominent symptoms: severe general malnutrition and intense blood dyscrasia, dyspepsia and obstinate constipation and phenomena connected with the neuromuscular system, one being striking and curious—viz., a brisk plantar cremasteric reflex. Dr. Boccavilla undertook some important serological investigations which yielded interesting results. Precipito-reaction was positive in all instances with an antigen of *Cysticercus cellulosæ*, negative with an antigen of *Cysticercus bovis*. Deviation of the complement: results strongly positive for antigens from *C. cellulosæ* in dilutions of 1 in 10, negative in controls with antigen of *Tænia inermis*. Abderhalden's test was strongly positive with an antigen of *T. solium*. A further series of experiments showed a defective absorption both of nitrogen and phosphorus. The details given of this case point to the conclusion that cysticercus infection, especially if generalised, may produce in man a condition of toxæmia with definite changes demonstrable by serological tests and marked disturbance of metabolism. Clinically the symptoms of human cysticercosis, although they may be few and ambiguous, yet in some cases

in which the tolerance of the individual to the toxæmic condition is limited, assume a character entirely *sui generis* and such as to permit, under the guidance of an accurate semeiological study, a diagnosis of great probability, even apart from any specific investigations. Hence when an individual is observed to be the subject of a severe organic toxic condition, not attributable to any special infection, and presents phenomena referable to a multiple intracranial localisation or exhibits evident signs of muscular hyperexcitability to various stimuli accompanied by intense hypokinesis, early exhaustion, irregularity of the ergographic curve, without myotonia or change in the electrical reaction, then the possible existence of a latent cerebral and muscular cysticercosis must be taken into consideration even in the absence of intestinal evidence or peripheral cutaneous nodules. The suspicion will develop into probability if clinical investigation can eliminate the presence of tuberculosis, cerebral syphilis, or idiopathic myopathy. Finally, the diagnosis of latent cysticercus infection will derive valuable aid and confirmation from the application of serological methods, especially those of the precipito-reaction, deviation of the complement, and Abderhalden's test.

THE QUEEN'S HOSPITAL FOR CHILDREN.

AT the annual meeting of governors of the Queen's Hospital for Children, Hackney-road, E., held at the Mansion House on Tuesday last, with the Lord Mayor in the chair, the work and needs of this institution were prominently brought before the public. They are matters with which the medical profession is unfortunately too familiar in regard to civilian hospitals in general. The Queen's Hospital for Children specially serves a surrounding population of at least half-a-million people, mostly of the industrial classes, of East and North-East London, also drawing patients from Tottenham, Enfield, Edmonton, Walthamstow, and Leyton. Pressure on its beds has been greatly increased of late by the military occupation of most of the infirmary beds. The Poor-law authorities are endeavouring to meet their responsibilities with regard to the civil population by carrying out an increased system of out-door medical relief, but this does not meet the case of the sick child in the homes of the poor. Several general hospitals have reduced the work of their children's departments, thus throwing additional responsibility on the special hospitals. The official number of beds at the Queen's Hospital is 134, but last year the daily average of children in the wards worked out at 139, additional cases being put in basket cradles or in extra beds. This work has been done without an increase in the nursing staff, which has remained the same with the greatly increased work. A full medical staff has been kept up by the appointment of qualified women and by temporary appointments to the visiting staff for the period of the war. The accommodation of the seaside branch at Bexhill, opened in 1911 with 30 beds, has been increased by six beds, with the use of open-air shelters throughout the year, and in this way a larger proportion of sick children brought back to robust health. The period of stay at this branch is arranged at the discretion of the medical officer, working out last year at an average of 39 days. The total figures for 1916 showed: In-patients, 2161; out-patients, 43,665; and attendances, 108,432. Expenditure in 1916 exceeded £20,000, of which £19,000 have to be raised by voluntary contributions. At the end of four months' working this year the hospital is £3000 short of the sum required to pay outstanding accounts.

COLLOSOL COCAINE AND THE DURATION OF ANÆSTHESIA.

SINCE the publication in THE LANCET of April 28th of the reports of Professor W. J. Simpson, Professor R. Tanner Hewlett, and Dr. John Eyre on the experiments made with the view of testing the toxic and anæsthetic properties of collosol cocaine, several inquiries have been made by our readers on the important point of the duration of anæsthesia, to which a further report which has reached us provides an answer:—

Test of a Fresh Sample of Collosol Cocaine (1 per cent.) delivered April 25th, 1917.

University of London, King's College, Bacteriological Department. May 8th, 1917.

Toxicity Test, May 4th, 1917. Rabbit, weight 2050 grammes.
19·5 c.c. injected intravenously. No toxic effect whatever produced.

Anæsthesia Test.

I. ½ c.c. injected subcutaneously in rabbit at 2.36 P.M.
At 2.38 slightly insensitive at area of injection.
,, 2.39 quite insensitive ,, ,,
This was maintained until 2.55.
At 3.0 sensibility returning, which continued until at 3 30 sensibility had completely returned.

II. ½ c.c. dropped in two lots (i.e., ¼ c.c. each) into eye of rabbit at interval of 3 minutes—at 2.37 and 2.40 P.M.
At 2.44 eye quite insensitive.
,, 2.47 do.
,, 2.55 do.
,, 3.0 sensation returning.
,, 3.15 sensation practically returned.

W. J. SIMPSON.
R. T. HEWLETT.

Apart from the duration of anæsthesia it is noteworthy that as much as 19·5 c.c. of a 1 per cent. solution of collosol cocaine proves to be non-toxic when intravenously injected into a rabbit. Further investigations in this interesting field are being carried out.

ANKYLOSTOMIASIS IN ASSAM.

AN interim report upon an investigation into the incidence of ankylostome infection among the coolies employed in the tea-gardens of the Darjeeling district, Assam, has been recently published by Major Clayton Lane, I.M.S., in the *Indian Journal of Medical Research*. The object of the inquiry was threefold—namely, to ascertain the amount of the infection in the locality, to free those infected from the parasites, and to find out if possible what effect the existence of ankylostomiasis had upon the general health and working efficiency of the labourer. Having secured the coöperation of the managers of the tea-gardens, Major Clayton Lane proceeded, as a preliminary measure, to rouse the interest of the native workers in the investigation by means of lectures and demonstrations, illustrated by lantern slides. This he did for the purpose of inducing the coolies to permit samples of their bowel discharges to be examined microscopically for the presence or absence of the ova of the ankylostome worm. After surmounting numerous difficulties he was ultimately successful in obtaining 11,142 samples of fæces from the workers in 10 tea-gardens, from prisoners in the local jail, from members of the local police, from children attending some schools, and from inmates of the mission homes. Of the total examined 7356, or 66 per cent., were found to be infected by the hookworm, *Necator* (or *Uncinaria*) *americanus*, which is the only variety of ankylostome worm found in the locality. It may be remarked here that in spite of its name the *Necator* is widely distributed in the old world, being found in other parts of

India, e.g., Burma, while it is common in Ceylon. The Philippine Islands, tropical Africa, and North-West Rhodesia are also among its hunting grounds. Among the 11,142 samples of fæces examined 7541, or 68 per cent., were infected by *Ascaris lumbricoides*. A register was kept of the results in each instance; those persons found not to be suffering from ankylostomiasis received a certificate to that effect, and those infected received treatment which was mainly by thymol, the dose for an adult being 60 grains divided into three doses given at hourly intervals on an empty stomach. The stools were subsequently re-examined and, if necessary, a second or a third course of treatment was given to ensure freedom from the infection. As regards the attempts to estimate the effects upon bodily energy that may have followed upon the freeing of the coolie from infection, nothing very definite can as yet be stated; but the investigation is being continued and information is being collected from the managers of tea-gardens as to the amount of work now done by those cured of their worm infection as compared with what they did a year ago. The coolies themselves have expressed satisfaction with the results of their treatment in bringing to them a new feeling of energy and well-being.

MICROPSIA AND MACROPSIA.

THE latest volume of *Transactions of the Ophthalmological Society of the United Kingdom* contains a paper by Dr. S. A. K. Wilson on a symptom of not infrequent occurrence, under both physiological and pathological conditions, which presents certain features of interest. By micropsia is signified a disturbance in the visual appreciation of the apparent size of objects, whereby they seem smaller than they really are; macropsia is the term for the opposite condition. As a new word to combine both of these Dr. Wilson suggests "dysmetropsia," which may be taken to indicate defect in the visual appreciation of the measure or size of objects, whether by over-estimation or under-estimation. It is well known that dysmetropsia may occur as a transient phenomenon in fatigue states; and in the normal individual with uniocular vision alteration in the apparent size of objects can readily be demonstrated. If, one eye being closed, the other is directed on the finger placed between the eye and a printed page, the letters on the latter appear to grow smaller or larger as the finger is moved to or from the eye. Further, objects appear larger when seen through a fog while the sun and moon are apparently larger when seen at the horizon than at the zenith. There are various pathological states of the nervous system in which the phenomenon of micropsia or macropsia occurs, and Dr. Wilson has collected in his paper a number of instances from his own observation. These he has classified into two groups—viz., dysmetropsia of peripheral causation, and of central causation, the latter group being subdivided into cortical and transcortical varieties. In the first category are placed examples of the syndrome occurring in the course of tabes dorsalis, syphilitic basal meningitis, and disseminated sclerosis, where it is clear the cause of the dysmetropsia is a defect in the peripheral mechanism of accommodation. Actual retinal distortion from sarcoma of the choroid, retinitis, &c., may also have the same effect. In the second group Dr. Wilson records cases illustrating micropsia or macropsia as an aura in epilepsy, as a prominent feature in migraine, as a symptom in the course of cerebral tumour. In the transcortical group, including so-called psychical cases, he records, among others, a severe case of hysteria, the patient being a woman of 29, with hysterical ptosis and other typical hysterical symptoms. She had noticed that objects seemed much larger with the right eye than with the left, and, further, that with binocular vision the right half of objects was always much bigger than the left. Any round object, such as a ball, always appeared to bulge out on its right side. In other words, with the right eye only the condition was one of macropsia, with binocular vision of right hemimacropsia. This case in some ways resembles one described by Pierre Janet in his work on the psychoneuroses. Dr. F. W. Mott has reported the case of a Canadian officer suffering from shell shock who complained of seeing everything greatly magnified—his bandolier of cartridges looked as large as a pom-pom belt. Organic cases also, however, may show this dysmetropsia as a transcortical or psychical symptom, as in one under Dr. Wilson's care where the patient was a member of the medical profession and his observation therefore of enhanced value. This patient suffered from a cerebral tumour of the right occipito-parietal region, and among his symptoms were visual hallucinations of a macropsic nature; he thought he saw objects in front of him which were not really there, and they were apparently "very large and very near." It appears, then, that the phenomenon of dysmetropsia may be caused by disturbance of function on any of the levels of nervous function described by the late Dr. Hughlings Jackson as the lowest, middle, and highest levels—i.e., peripheral or subcortical, cortical, and transcortical or psychical levels. In his paper Dr. Wilson gives a suggested explanation of the pathogenesis of the condition and discusses the various factors that may be implicated.

THE MEDICAL INSURANCE AGENCY.

AT a meeting of the committee of the Medical Insurance Agency held last week, at the offices of the British Medical Association, the chairman, Dr. G. E. Haslip, presented the audited financial statement for the year 1916.

The annual statement showed that, in spite of the war, the surplus available for medical benevolent purposes had reached the sum of £841, compared with £798 in the previous year. The Agency was able during the year to distribute £230 to the Royal Medical Benevolent Fund, £160 to the Royal Medical Benevolent Fund Guild, £145 to Epsom College Benevolent Fund, £50 to the R.A.M.C. Officers' Benevolent Fund, £50 to the Auxiliary R.A.M.C. Fund (Officers' Benevolent Branch), £30 to the Royal Medical Benevolent Fund Society of Ireland, £25 to THE LANCET Special Fund, and £15 to the Royal St. Anne's School. In addition to these amounts, last week the committee was able to make an interim distribution on the current year of £200 to the Royal Medical Benevolent Fund, £100 to the Royal Medical Benevolent Fund Guild, £150 to Epsom College Benevolent Fund, and £50 to the Royal St. Anne's School.

Dr. Haslip mentioned in his report that since its formation the Agency had been able to devote a total sum of £2805 to medical benevolence, while the individuals insuring had received rebates amounting in the aggregate to £5300. This may be regarded as a highly satisfactory financial position and one which demonstrates the good work which the Agency is accomplishing for the medical profession. By insuring through the Medical Insurance Agency favourable premiums are obtained as well as benefit conferred on medical charities. The secretary of the Agency is Mr. Guy Elliston, 429, Strand, W.C. 2.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM: ANNUAL CONGRESS.

THE Annual Congress of this Society was held on May 3rd to 5th inclusive, under the presidency of Mr. E. TREACHER COLLINS. The general discussions took place at the house of the Royal Society of Medicine, a debate on "Employment of the Blind" was held at St. Dunstan's, Regent's Park, and the clinical cases were inspected and discussed at the Royal London Ophthalmic Hospital, City-road.

At the opening meeting on Thursday morning the PRESIDENT referred to the great loss which the society and ophthalmology had sustained by the death of Mr. Walter H. Jessop, a former President and a most enthusiastic worker in the specialty. In his introductory address he dealt at length with the subject "The Sequelæ of Hypotony." The following is a brief statement of his conclusions:—

I. That hypotony may occur in connexion with several different affections of the eye, and the sequelæ to which it gives rise may be considered apart from the affection causing it.

II. That the sequelæ of hypotony vary in different cases according to the chamber (the aqueous or the vitreous) in which the pressure is most reduced, and according to its degree, duration, and rapidity of onset.

III. That the sequelæ of hypotony may be classified as follows:—1. Those due to relaxation of tissues usually kept taut: (*a*) wrinkling of the anterior elastic lamina of the cornea, producing superficial double-contoured lines; (*b*) wrinkling of the posterior elastic lamina of the cornea and layers of the substantia propria immediately adjacent to it, producing deep-seated striated opacities; (*c*) thickening of the sclerotic and the production of puckers in it behind the insertions of the recti muscles; (*d*) wrinkling of the elastic lamina of the choroid, and heaping up of the pigment epithelium on its inner surface where the folds are deep; and (*e*) displacement forwards of the lens and slackening of its suspensory ligament, both of which tend to increase the refraction of the eye. 2. Those due to production of relatively higher blood pressure compared to intra-ocular pressure than exists under normal conditions: (*a*) In the choroidal veins the normal excretion of lymph through them is arrested, and, instead, an exudation of lymph takes place, giving rise to detachment of ciliary body and choroid; (*b*) in the veins of the iris the normal excretion of the aqueous humour through them is arrested, and, instead, an exudation of lymph into the anterior chamber takes place, this exudation altering the normal consistency of the aqueous by increasing its percentage of proteids and rendering it spontaneously coagulable; (*c*) in the capillary vessels of the ciliary body the secreting function of that structure is quickened, and an exudation of lymph takes place, the albuminous constituents of which, in a rabbit's eye, being unable to permeate the epithelial lining of the part, raises it up in the form of vesicles; (*d*) in the capillary vessels of the choroid the normal exudation of lymph is stimulated, which, if it permeates the pigment epithelium, may collect beneath the retina, causing detachment of that membrane; and (*e*) in the retinal vessels of the optic disc the normal excretion of fluid from the vitreous is arrested, and an exudation of lymph into the head of the optic nerve takes place, giving rise to the appearances of choked disc.

The paper was discussed by Sir ANDERSON CRITCHETT, Mr. S. JOHNSON TAYLOR, and Mr. J. HERBERT PARSONS.

Lieut.-Col. R. H. ELLIOT, discussing the foregoing address, said that some years ago he pointed out that a condition of hypotony might exist for many months, or even for years, in patients who had undergone sclero-corneal trephining without any evidence that the eyes had suffered thereby. Others, including Mr. Treacher Collins, had confirmed the observation. Because cataract followed, or was considered to follow, the operation for glaucoma, it was not necessarily the result of the hypotony produced, or even of the operation itself. Cataract might precede glaucoma, and, under the conditions met with in high-tension eyes, it was possible for the lens opacities to be overlooked at the time. He thought there were other conditions besides a direct wound of the lens during operation which might determine the formation of a cataract. He had been able to keep in touch with cases for six years, and was able to say it did not necessarily cause opacities of the lens; indeed, it was open to question whether it ever did. The expectation that an artificial hypotony would lead to serious changes in the eye was largely due to a confusion of ideas. It was very erroneous to consider the condition of the contents of the eye as though the problem were one of hydrostatics; it was really one of hydrodynamics. The manometer was far too coarse an instrument to give reliable indications of the minute differences of pressure which certainly existed in the various chambers of the eye. The most helpful part of the President's contribution was that which referred to the transudation of serum into the anterior chamber from the surface of the iris, the posterior chamber remaining free of the pathologic exudate. He agreed as to the transitory tendency towards myopia after trephining: he had often noted it; he had seen as much as 2½ diopters of myopia within a fortnight of the procedure. As the flap consolidated the chamber deepened, the lens system receded, and the myopia disappeared, the eye gradually returning to its original state of refraction.

The PRESIDENT replied.

Mr. A. HILL GRIFFITH read a paper on Transmitted Glioma of the Retina.

Captain W. WALLACE contributed a paper on Conditions Affecting the Standard of Vision in the Army. He urged that in aiming at efficiency in this matter the standard of the patient, and especially his mental attitude, must not be disregarded. He discussed the changed visual standards set up by the Army Council, which, he believed, had not resulted in any considerable transfer into Class A of those formerly in a lower category. For example, of 723 cases only 46 were raised from B to A, while 11 went from A to B. He supported his views by a carefully compiled table.

The discussion revealed conclusions at variance with those of the author, and in the end a resolution was agreed to in regard to the visual standards in the Army.

Captain R. R. CRUISE read a paper on Protection of the Eye in Warfare. He said it was hoped that the measure of protection against injuries to the head afforded by the steel helmet would find a parallel, in the case of the eye, in the visor which he had designed, and which the War Office had accepted and adopted. This visor was now on extensive trial. From the point of view of protection, the injuries may be divided into two classes: (*a*) preventable, and (*b*) non-preventable. The simplest instances of the first class were those in which a small shell splinter penetrated the globe, and of the second category a bullet traversing both orbits. To obtain an accurate conception of the extent of the preventable class, a large number of cases must be carefully examined. In some cases it was difficult to know into which category to place them. Among the definitely preventable were cases in which the cornea was incised, the iris prolapsed, and a septic panophthalmitis ensued, cases in which a foreign body had had sufficient energy to penetrate the globe but not to pass out of it. In the same class also were contusions of the globe producing a varied and common picture of dislocated lens, traumatic cataract, irido-dialysis, intraocular hæmorrhage, and retinal lesions. He had been surprised at the relatively few cases of detachment of the retina which his war experience had included. Morex and Moreau, of Paris, estimated that 54 per cent. of casualties to eyes in a series of 488 cases of injury caused by shell, grenade, or bomb were produced by small particles, the condition being that 50 per cent. of all eye injuries could be prevented by some sort of gauze shield. From the examination of a very large number of cases of eye injury during the war Captain Cruise found that 58 per cent. of them were preventable; 42 per cent. non-preventable. The visor consists of a transparent mesh of steel rings so closely linked together that only the most minute particles could pass through its meshes, and then only if the impact occurred at right angles to the plane of the surface. The visor is attached to the helmet, and when not required is easily thrown on to the brim of the helmet and as easily lowered again into position when required. The links were chemically treated to render them rust-proof.

The society passed the following resolution:—

The Ophthalmological Society of the United Kingdom, having examined the steel visor designed by Captain Cruise, has every reason for believing that it would prevent at least 50 per cent. of the eye injuries received in warfare. The visor has received the strong approval of ophthalmic surgeons in the field and at home. This society begs respectfully to urge that its production should be expedited, and that its application and method of use should be placed under the supervision and control of a competent authority.

Mr. J. GRAY CLEGG read a paper on "Sclerocorneal Trephining for Hypertension, with Results of some 250 Cases."

(*To be concluded.*)

THE RECENT VACCINATION ORDER.—The Association of Public Vaccinators of England and Wales has been in communication with the Local Government Board regarding the scope of the recent Order permitting medical officers of health to vaccinate small-pox contacts. The reply of the Assistant Secretary to the Board, dated April 25th, runs as follows:—

I am directed by the President of the Local Government Board to advert to your letter of the 30th ultimo and to state that the object of the Public Health (Small-pox Prevention) Regulations, 1917, is to empower a medical officer of health to vaccinate or revaccinate contacts with cases of small-pox. The Board anticipate that the need for this will only arise when the services of the public vaccinator are not immediately available. In ordinary circumstances the operations should be performed by the public vaccinator as hitherto.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Society of Medical Radiology.

THE Under Secretary of State for the Service of Health recently presided at a meeting of this society. M. Ledoux-Lebard contributed a study of practical methods at the front and at the base. He agrees with Ombrédanne that extraction of foreign bodies by the aid of intermittent screen control is now a possibility, given conditions allowing the surgeon sufficient latitude for operating without exposing him dangerously to the rays. But whatever technique may be adopted any difficult exploratory operation should be performed on a radiological table. Of this there seems to be no doubt. M. Aubourg and M. Barret reviewed the various types of radiological installation in the Army, and asked for the radiologist to be given the choice of exploratory method for establishing his diagnosis, alleging a great saving of plates by this means. M. Rechou emphasised the large place now held by radiotherapy in the treatment of gunshot wounds. M. Belot described a very exact procedure demanding the minimum of special appliances, while allowing the ophthalmologist to locate a foreign body precisely by means of four radiographic plates. M. Béclère stressed the necessity of confining the direction of radiological services to doctors, requiring, as it does, a combination of anatomical, physiological, pathological and chemical knowledge which only medical men possess. Finally, M. Delherm and M. Kindberg demonstrated the advantages of radio-diagnosis in suspected pulmonary tuberculosis among soldiers. Sometimes the symptoms may be shown by means of the rays to be of purely functional origin, in other cases early diagnosis is rendered possible, and in a third group the pulmonary origin of obscure symptoms is established thereby. The help of the radiologist is likely to result in great benefit to Medical Boards.

Superiority of Agricultural Work to Physico-Therapy.

At the Academy of Sciences M. Bergonié related the result of comparative observations extending over 30 months showing the superiority of agricultural work, medically prescribed and supervised, over the physical institutional treatment of the results of gunshot wounds. This is specially the case with men formerly agricultural labourers, who naturally return with readiness to their former habits of fresh-air life, and in so doing recover almost unconsciously the movements to which they have been accustomed since early youth. Fatigue is diminished thereby, inasmuch as attention is not continuously in demand; it is the reflex arc, physiologically almost inaccessible to fatigue, that is brought into play. M. Bergonié finds agricultural work applicable to all varieties of disability, granted that the routine is prescribed and supervised by a medical man. The results of this functional re-education in the Bordeaux district have been most gratifying from the point of view of both moral and physical fitness. Naturally the treatment has a wider application during fine weather than in autumn or winter.

The War-time Pot-belly.

M. Dénéchau and M. Mattrais recently drew attention at the Medical Society of the Hospitals to a singular morbid condition observed by them on several occasions, manifesting itself in a peculiar deformation of the abdomen associated with gastro-intestinal disturbance. The subjects are tired persons complaining of colitis, vomiting, alternate constipation and diarrhœa, with emaciation; the abdomen becomes distended and prominent, walking is impeded, and the presence of Pott's disease occurs to the mind. The resemblance to a seven or eight months pregnancy is striking, but the size of the abdomen varies somewhat in different positions, especially on lying down, and the volume is reducible to some extent by vigorous flexion of the thighs. The poor general condition of the patients may also raise a suspicion of chronic peritonitis, and discharge be recommended on this account. Of M. Dénéchau's 18 cases, 5 were already under consideration for discharge. The deformation was, however, shown to be of a motor nature, partly voluntary or subconscious, resulting from depression of the diaphragm—a fact which could readily be established by radioscopy. The crises of colitis and the occasional aerophagia from which these patients suffer give rise to auto-suggestion of grave abdominal mischief.

The Administration of Quinine in Syphilis.

In his malarial clinic at the Pantheon Hospital, M. Jeanselme has collected a number of observations having the absolute value of laboratory experiments. At this hospital patients are submitted to intensive quinine treatment, some of them having received as much as 40 grammes of the hydrochlorate. A few of these patients developed syphilis during quinine treatment, the exact day of infection being ascertainable; the disease was found to run its course in precisely the same way and in the same time as in cases not under the influence of quinine. It follows that in syphilis quinine has neither a preventive nor a curative action.

A Gastric Hair-ball in a Girl.

Dr. Dauriac aroused keen interest at the Academy of Medicine last month by communicating the case of a girl aged 13 whose stomach was entirely filled by an enormous bundle of hair of the same consistency as those sometimes found in horses. The child had contracted in infancy the strange habit of biting and swallowing locks of her own hair. This mass occupied the lumen of the stomach and the first part of the duodenum. Digestion was defective and the child was becoming emaciated. Dr. Dauriac excised the stomach with its contents, the nature of which was not suspected. The end of the œsophagus, fortunately much elongated, was sutured to the pylorus, the child recovering rapidly from the operation and regaining full digestive powers.

THE CONTROL OF VENEREAL DISEASES.

A Comparison of English and American Methods of Venereal Control.

THE *Journal of the American Public Health Association* for April, contains an editorial article on the prevention and cure of venereal diseases, in the course of which, after describing the Local Government Board Regulations, the writer adds:—

> This remarkably thorough organisation for dealing with social diseases is the outcome of the report of the Royal Commission, which contains statistics and facts regarding the situation, full of interest and illustrative not more of the conservative way in which legislation is undertaken in Great Britain in matters affecting the liberty of the citizen than of the scientific and thorough manner in which legislation when once enacted is put in force. The elevated ideas along social lines which prevail in Parliament are well illustrated when they accept the findings of a scientific commission as a sufficient guide to them in passing legislation of so drastic a character as that in recent Acts.
>
> It is probably true that on the American continent similar legislation is more readily obtained when public agitation has been worked up than in England; but the practical difficulties in its enforcement are usually found not more in the refusal of the general public to submit to drastic regulations than in the extremely varied character of our administrative machinery. It is true that in most States and Provinces local Boards of Health are appointed, while in probably all such the boards in cities and towns where hospitals are located have fairly adequate public health by-laws. What is, however, altogether too prevalent is the evil of temporary political appointments of health officers with, in consequence, tenures of office unfortunately very uncertain.

The article concludes by foreshadowing for the United States legislation of an adequate character, such as that recently passed in this country, but including compulsory notification and supervision of all patients until completion of treatment. In this way "the first real steps in advance in the solution of this, the most difficult of all public health problems, will have been taken."

Dr. R. R. Rentoul calls our attention to penal clauses in regard to venereal diseases which appear in the legislature of various North American States, e.g.:—

> State of Oregon, Feb. 28th, 1913.—S. 1. Applicant for permit to re-marry must file a certificate from an authorised physician, made under oath, that the male applicant is free from contagious or infectious venereal disease. S. 2. Physician making false statement shall lose his diploma. S. 3. Fee for doctor's certificate 2 50 dols.
>
> North Dakota, 1913.—S. 1. No woman under the age of 45, or man of any age, except he marry a woman over 45, either of whom is ..... afflicted with pulmonary tuberculosis in its advanced stage, or of any contagious venereal disease, shall hereafter inter-marry or marry any other person within this State. S. 2. Penal for clergyman to join in marriage such persons. S. 5. Fee for doctor's certificate 2 dols. S. 6. Fine for illegally joining in marriage 50 to 500 dols. or imprisonment for 30 days.
>
> State of Pennsylvania, 1913.—S. 1. No permit to marry if either of the contracting parties is afflicted with a transmissible disease. S. 4. Applicant may appeal to a court free of expenses.
>
> State of Michigan, 1905.—S. 6. No insane person, idiot, imbecile, or person who has been afflicted with syphilis or gonorrhœa, and has not been cured of the same, shall be capable of contracting marriage. Certificate of being cured must be signed by two qualified physicians. Anyone aiding or assisting such to marry may be fined up to 1000 dols., or to imprisonment up to five years.

Salvarsan or Neosalvarsan?

The relative value of the various organic preparations of arsenic at present on the market is by no means firmly established. In the *British Medical Journal* of May 5th Lieutenant-Colonel L. W. Harrison and his coadjutors at the Rochester Row Military Hospital, Major C. F. White and Mr. C. H. Mills, emphasise the obvious difficulties which seriously limit the intravenous administration of these preparations, and the great advantage of the hypodermic method if rendered painless and proved to be as effective as the other. After investigating the Wassermann reaction in a series of more than 100 cases treated by means of the various preparations, some administered intravenously, others hypodermically, they conclude: (1) The intramuscular or subcutaneous injection of neosalvarsan, novarsenobenzol, or novarsenobillon is superior in immediate therapeutic effect to that of the intravenous injection of salvarsan, kharsivan, arsenobenzol, or arsenobillon; (2) spirochætes disappear from syphilitic lesions just as rapidly after the first intramuscular as after the first intravenous injection, and the Wassermann reaction is more quickly influenced; (3) solution of the dose of neosalvarsan in 1 c.c. of 4 per cent. stovaine and emulsion in creo-camph cream eliminates discomfort sufficiently to make the intramuscular injection of neosalvarsan practicable for routine use. This result, if confirmed, will much simplify the work of the venereal treatment centres as well as that of the practitioner called on to administer organic arsenic.

Routine Treatment of Syphilis at the Hôpital Broca, Paris.

Military needs require a short, intensive treatment of syphilis for the soldier in order to send him back as soon as possible to his place at the front. In the *Paris médical* of May 5th Dr. Hudelo, physician to the Hôpital Broca, describes the routine treatment, lasting 40 days, adopted in the hospital since the outbreak of the war. Nine injections of 0·3–0·9 gm. of novarsenobenzol (4–5 gm. in all) are given at intervals of five days interspersed with 20 injections each of 0·01 gm. mercuric cyanide. In every case the patient left the hospital with a negative Wassermann reaction. On his discharge-sheet is written an instruction to receive further mercurial treatment, by pill or injection, after an interval of not more than two months. Dr. Hudelo writes:

> We hope, by this association of arsenic and mercury, that the spirochætes put out of action but not killed by the arsenobenzol, which disappears from the system in 48 hours, and still maintaining a stand in some corners of the organism will succumb completely to the spirochæticidal action of the mercury. We note with pleasure that a method identical with that here suggested has been adopted in military practice, amongst others, by Favre and Longin, Pautrier, Goubeau, Pasteau and Mallein, Ravaut, and Thiblerge.

The British Journal of Dermatology and Syphilis.

The *British Journal of Dermatology* has existed for 28 years, and during that long period has done a large amount of excellent work in the province of dermatology. It has now been decided to change its title by the addition of "Syphilis," in view of the prominent place that syphilis holds in dermatological work. All who have had much experience in the diagnosis and treatment of diseases of the skin know that syphilitic rashes are frequently unrecognised, and the results of these errors of diagnosis are deplorable. If syphilis is recognised and treated in the secondary stage when skin manifestations are mostly seen, the spread of the disease would be greatly diminished and those more serious and later results would be rendered impossible. We therefore welcome the change in the title of this important journal, for it emphasises the need for syphilis to be recognised and treated while it affects mainly the skin and before it has had time to establish itself as a constitutional affection.

Courses of Instruction.

A course of instruction in the clinical pathology of venereal diseases will be given by Dr. J. Eyre to practitioners, post-graduates, and students, in the pathological theatre of Guy's Hospital Medical School, at 5 P.M. on May 21st, 23rd, 24th, and 25th. Laboratory demonstrations in the bacteriological laboratory follow each lecture at 6 P.M. Members of the medical profession to be admitted on presentation of their cards.

Enlightenment Campaign.

The acting medical officer of health of the borough of Deptford, Dr. Murdoch Macdonald, has arranged or a conference of the citizens representing the various interests —municipal, industrial, educational, social, and religious— in the borough of Deptford, to be held in the Council Chamber at the Town Hall on Wednesday, May 23rd, at 8 P.M., when Mr. A. R. Turner and Mrs. Gotto will outline the work of the National Council for the Prevention of Venereal Diseases.

Major F. W. Mott, F.R.S., delivered an illustrated lecture on the Pathology of Venereal Disease at the Royal Institute of Public Health on May 9th. He emphasised the fact that pathology had now done its work in finding the cause of venereal diseases and the means of remedying them, and that it was for the State, acting on this work, to take such measures as were necessary to prevent, or failing that to cure, venereal diseases.

NATIONAL HEALTH INSURANCE.

The Public and Panel Practice in London.

RECENT circulars, numbered D 8, D 9, have been addressed to various bodies interested in the administration of National Insurance, and a Subcommittee of the Panel Committee for London has drafted a memorandum upon them, which has been adopted by the Committee and which is of interest because of its broad outlook. Recognising itself as only competent to speak for members of the medical profession upon the panel in London, but at the same time representing a body of 1500 such practitioners, the Subcommittee has been able to compile a series of notes and suggestions of a very varied character. Some of the questions are not such as medical men directly engaged upon insurance work can answer authoritatively, but it is all to the good that medical attention should be drawn to them. For example, the general feeling of insured persons towards insurance and the medical benefit provided under it is a matter deserving the notice of a busy panel practitioner, but for the most part his time is so fully occupied in attending to his patients' illnesses that their opinions on panel practice at large may not interest him. His hours of work and his banking account may afford him the impression that his own efforts are appreciated, or otherwise, but that is an individual matter. According to the memorandum of the London Panel Committee, he is likely to be told by his patients about administrative difficulties, such as delay in the payment of sickness benefit, or in providing medical cards, if he shows himself sympathetic, and this he should certainly be. This would seem to suggest that the insured person may be more prone to grumble, whether justly or not, at the shortcomings of those engaged on administration when in conversation with the medical man, and to ventilate any grievance against his medical attendant in communications with officials of his Approved Society, or with the Insurance Committee. In any case the small number of applications by insured persons in London to make their own arrangements with medical practitioners outside the panel is evidence of general satisfaction with the attendance provided by those within it.

With reference to the general feeling of the medical profession in London towards insurance practice, the Subcommittee believes that the majority of those engaged in it find the conditions preferable to those formerly prevailing in club practice or private practice in poor districts. It does not go further than that. As to the conditions which would bring into panel practice more of those general practitioners who, chiefly in wealthier areas, now decline to engage in it, the Subcommittee offers no precise opinion. It has suggested, however, certain improvements which it is inclined to believe would bring in a considerable proportion of those who now stand aloof. In any case, however, it has been found that an overwhelming majority of panel practitioners in the metropolis prefer the present conditions to the prospects offered by a whole-time salaried service, for which, by the way, no definite scheme has ever been put forward for consideration by anyone in a position to do so with authority. The memorandum summarises the principal reasons upon which the preference referred to is based. The suggestion may be added that at the present time a very large proportion of the medical profession is now gaining experience as to some, at least, of the drawbacks or advantages of service under a controlling authority.

Service under the War Office, whether at home or abroad, at the present date may differ widely from service under a civil authority in time of peace, but the mere experience of service as such is likely to have done much in shaping the opinions of those most concerned as to the desirability of the revolutionary change which a "service" implies. All these general topics affecting medical practitioners on the London panel have their bearing on the question of the remuneration, summarised in the question, "If a panel practice and the remuneration derived from it were the sole work and pay of a practitioner, would such a practice of average size enable him to maintain a social position suitable to his professional status?" The memorandum replies by calling attention to the fact that panel practice is usually combined with other forms of practice, but as to the question as it stands expresses the view that the remuneration there referred to is inadequate, having regard to the length and cost of the period of education, and "the desirability of a professional man being able to educate some of his children to follow his own calling." It might have said that the maintaining of his social position by a professional man must include the bringing up of all the members of a fair-sized family so as to enable them to occupy a position equal to that of their father. This, we suggest, would constitute a problem of some difficulty for a member of the medical profession in the metropolitan area earning only the income afforded by a panel practice of "average size." It emerges from the memorandum that the question of remuneration will be one of the first importance if ever any statesman proposes a concrete scheme of salaried service. If that remuneration is to be based upon the acceptance of panel conditions by panel practitioners under pre-war conditions it is not likely to prove satisfactory to its proposed recipients. As to this the memorandum contains a timely reminder in a note which calls attention to the varying economic and other conditions due to the war—to rising costs of commodities and of services which may never resume their former rates, and to the lowered comparative value of salaries and fees. With these altered conditions affecting all professional life in the future there must be included for the consideration of medical practitioners the grave problem of the disabilities of soldiers, sailors, and civilian workers likely to be found due to the ordeal through which the country is passing. The above are, as we have indicated, some of the general questions dealt with in the memorandum of the Panel Committee of London. More particular topics have to be discussed in the light of conditions prevailing in and affecting particular localities.

URBAN VITAL STATISTICS.

(Week ended May 12th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 15·3, against rates declining from 18·5 to 15·7 per 1000 in the four preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 15·4 per 1000, and was equal to that recorded in the previous week; among the remaining towns the rates ranged from 5·4 in Acton, 6·7 in Eastbourne, and 7·5 in Barrow-in-Furness and in West Hartlepool, to 23·6 in Halifax, 23·7 in Sunderland, and 29·8 in Middlesbrough. The principal epidemic diseases caused 419 deaths, which corresponded to an annual rate of 1·3 per 1000, and included 252 from measles, 54 from whooping-cough, 47 from infantile diarrhœa, 45 from diphtheria, 12 from enteric fever, and 9 from scarlet fever. The deaths from measles were 34 below the average in the previous weeks, and caused the highest annual death-rates of 3·1 in Dudley, 3·2 in Salford, 3·9 in Sunderland, and 4·8 in South Shields. The 707 cases of scarlet fever and 1179 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 32 and 24 below the numbers remaining at the end of the previous week. Of the 4936 deaths from all causes in the 96 towns, 152 resulted from violence. The causes of 39 deaths were uncertified, of which 8 were registered in Birmingham, 5 in Liverpool, and 3 each in Bury, Manchester, and South Shields, but not one in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 15·9, against 18·4 and 17·2 per 1000 in the two preceding weeks. The 339 deaths in Glasgow corresponded to an annual rate of 15·8 per 1000, and included 41 from measles, 36 from whooping-cough, 6 from infantile diarrhœa, 3 from diphtheria, and 1 from scarlet fever. The 107 deaths in Edinburgh were equal to an annual rate of 16·8 per 1000, and included 15 from whooping-cough, 11 from measles, and 1 from scarlet fever.

Irish Towns.—The 155 deaths in Dublin were equal to a rate of 20·3, or 1·7 per 1000 less than that recorded in the previous week, and included 6 from measles, 3 each from enteric fever and whooping-cough, and 1 each from diphtheria and infantile diarrhœa. The 132 deaths in Belfast corresponded to an annual rate of 17·5 per 1000, and included 4 from infantile diarrhœa, 3 from measles, 2 from enteric fever, and 1 each from scarlet fever and diphtheria.

Obituary.

MARC ARMAND RUFFER, KT., C.M.G., M.A., M.D. OXON., F.L.S.,

PRESIDENT OF THE SANITARY COUNCIL OF EGYPT.

Sir Armand Ruffer, who died at sea as he was returning to Egypt from Salonika, where he had gone to reorganise the sanitary service for the Greek Provisional Government, was one of the great medical administrators of his time.

Marc Armand Ruffer was born at Lyon in 1859, son of the late Baron Alphonse Jacques de Ruffer. His mother was German, and the son was therefore brought up with an intimate knowledge of three European languages. He was educated at Brasenose College, Oxford, and University College, London, taking his Arts degree in 1883 and obtaining his medical qualification four years later. From the first interested in pathological work he became a pupil of Pasteur and Metchnikow at the famous Institute in Paris, and on returning to London continued to work at the problems of phagocytosis, which were then of new and surpassing interest. His first important article was contributed in 1890 to the *Quarterly Journal of Microscopical Science*, and in the same year he read a paper at the annual meeting of the British Medical Association on the destruction of micro-organisms during the process of inflammation. In these papers clear expression was given to the conception of inflammation as a protective mechanism serving a useful purpose against infection, and in one of them Ruffer described the diphtheritic membrane as a battlefield in which amœboid cells contended with the pathogenic microbes of the disease. His further work on phagocytosis in the intestinal canal has not yet received the recognition which it deserves. It was at this time that Ruffer became the first director of the British Institute of Preventive Medicine, where he was assisted by Professor H. G. Plimmer. At Metchnikow's suggestion the two pathologists turned their attention to cancer, and they succeeded in establishing the fact that the intracellular objects seen in cancer cells did not resemble any known form of cellular degeneration. The last work Ruffer carried out at the Institute was on diphtheria, for which the antitoxic serum was then a new discovery. The preparation and testing of the serum was a laborious and dangerous task, both Ruffer and Plimmer falling victims to the disease, Ruffer himself suffering so severely from diphtheritic paralysis that he resigned his directorship of the Institute and sought health on a visit to Egypt.

In 1896 Ruffer was appointed professor of pathology in the Medical School of Cairo in succession to Dr. Kaufmann, and here his latent administrative ability served him in good stead. He started to reorganise the school, collecting around him a staff of able men to carry on his traditions. His success was so evident that two years later he was offered and accepted the presidency of the International Sanitary, Maritime, and Quarantine Council of Egypt, which he retained throughout his life. The organisation which freed Egypt from cholera began with the building of stations on the pilgrim routes, especially at Tor on the Red Sea, where the director personally inspected the pilgrims, letting no suspicious case pass through. Without special knowledge of Arabic his linguistic capacity, combined with the exercise of great tact, enabled him to surmount the difficulties of the situation. In his administrative work he was upheld throughout by the late Lord Cromer, and later by the late Lord Kitchener, who both had the fullest confidence in the measures he proposed. His appointment on the Indian Plague Commission took him away from Egypt for a time, and the volumes of the Commission's reports may still be read with profit. To Ruffer was due the increasing recognition of the value of Haffkine's work.

Ruffer took the greatest interest in antiquarian work for which Egypt provided him ample opportunity. He made a careful investigation of the mummies of the eighteenth, nineteenth, and twentieth dynasties in the Hearst collection at Cairo, finding in them a great variety of grave pathological phenomena, including arterio-sclerosis, tuberculosis, lung disease, anthracosis, and multiple abscess of the kidney. In the morbid lesions micro-organisms were found still recognisable by their staining reactions, among them the tubercle bacillus. The aorta of Rameses II. which he sent to London

was examined by Professor Plimmer and found to show marked atheromatous change. Ruffer concluded that arterial lesions were as frequent 3000 years ago in Egypt as at the present time, and were even then due to the stress and responsibility of civilised life rather than of toxic origin. A study of the artistic productions of ancient Egypt enabled Ruffer to analyse the prevailing diseases of even earlier times, 5000 years or more ago. Achondroplasia, Pott's disease, talipes were recognised with certainty, probably also rickets. A volume of antiquarian studies likely to be of surpassing interest was ready for the press, but unfortunately prevented by the conditions of war from appearing.

At the outbreak of war Ruffer was appointed head of the Red Cross in Egypt and did a large amount of useful work in this connexion. After completely organising the means at his disposal he felt free to accept an invitation from the Greek Provisional Government to undertake the sanitary reorganisation in the Salonika district. His last letter records the fact that in spite of grave difficulties and discouragement good progress had been made in this work. It was during his return to Egypt that his lamented death occurred. Many honours fell to his share, among them the Grand Order of Medjidie and the Grand Order of Osmanieh in Egypt. He was a Commander of the Order of St. Saviour of Greece, St. Anne of Russia, and of the Cross of Italy, and an Officer of the Legion of Honour. His Companionship of the Order of St. Michael and St. George was granted in 1905 and supplemented by a Knighthood in 1916. Ruffer was a man of deep culture in the best sense. With his linguistic powers and knowledge of men he was peculiarly fitted to be a sanitary administrator of a great dependency. He was also a keen musician with technical mastery of the violoncello. Sir Armand Ruffer married Alice Mary, eldest daughter of the late Captain Greenfield, R.A., and is survived by his widow and three daughters.

PROFESSOR LANDOUZY,

DEAN OF THE FACULTY OF MEDICINE, PARIS.

WITH the death of Professor Landouzy in Paris, at the age of 72 years, on May 10th, after a long illness, the Paris Faculty of Medicine has lost its senior and most distinguished member. Louis Théophile Joseph Landouzy was born at Rheims in 1845, the son and grandson of medical men. Beginning his studies in the place of his birth, he went to Paris in 1867 to complete them, becoming hospital resident in 1870, and steadily ascending the professional ladder until his appointment as physician to the Hospital Laennec in 1890. Three years after this he accepted the chair of therapeutics at the Faculty of Medicine in Paris, bringing with it the membership of the Academy of Medicine. In 1907 he was chosen by the Faculty to be its dean, and in 1912 he was elected a member of the Institute. His most recent honour was the award of a gold medal for his work on infectious diseases by the Ministry of the Interior.



Landouzy had long become one of the familiar figures of contemporary medicine both in France and abroad. Endowed with a great capacity for work associated with remarkable physical activity he accomplished a very large amount of scientific work bearing on a variety of important questions. With Déjerine he described the special type of facio-scapulo-humeral myopathy which is now associated with both their names. But it is in connexion with tuberculosis that his name will be best remembered. The pathology of the lungs owes to him important researches, notably on primary tuberculosis of the pleura. He first described in 1883 a type of acute tuberculosis which he characterised as *fièvre bacillaire non-granulique à forme typhoïde*, or more briefly later as *typho-bacillose*, in which the ordinary morbid lesions of tuberculosis failed to make their appearance. More recently, in the *Presse médicale* of April 21st, 1906, he described a flexure of the little finger as *camptodactylie* occurring in tuberculous subjects. The little finger of a patient, he said, "tells his past, shows his temperament, and foretells his future." Later still he showed that the serum from the lesions of erythema nodosum produced tuberculosis when injected into guinea-pigs. In opposition to Calmette and others he upheld the origin of laryngeal tuberculosis by direct surface-infection. In the struggle against tuberculosis as a social disease Landouzy was ever to the front. He was delegate to the several international congresses on tuberculosis, and at Washington in 1908 expressed the belief that the centenary of Pasteur would witness the final extinction of tuberculosis. If he had lived to complete it, his last work would have been devoted to the organisation of an antituberculosis campaign in the Army and to the invaliding of the tuberculous soldier.

Two qualities in Landouzy which contributed specially to his success were his great facility in physical examination and an unusual clearness of verbal exposition. The combination made him a really great clinical teacher, a fact which Paris students did not forget even when his ruling as dean ran counter to their inclinations. He was devoted to his pupils, showing himself always a sure and considerate friend to them, an example of goodwill and approachableness. He organised travel studies to the French thermal stations, conducting them himself for a dozen years. He was present in London at the last International Medical Congress of 1913, when he read a paper on thermal treatment and spoke as the official delegate at the dinner given by Lord Beauchamp on behalf of the British Government. During the last winter his health had been very variable, largely due to the extra work which he had taken upon himself in the charge of a military clinic at the Lycée Buffon in addition to his ordinary occupations. He had recently undergone two surgical operations and death was due to an attack of uræmia. He leaves behind him regret on the part of all who knew him.

HENRY WILLIAM WILLIAMS, M.D., C.M. ABERD.

Dr. H. W. Williams, whose death has occurred at the village of Guilsborough, Northants, was 81 years of age, and had been for more than 30 years actively associated with the Salvation Army. Born in 1836 and educated at Aberdeen University, Queen's College, Birmingham, and Anderson College, Glasgow, he was for a long time on the active staff of two London hospitals, the Western Skin Hospital and the Margaret-street Hospital for Consumption, to both of which he was at the time of his death senior consulting physician. He was one of the founders of the British Medical Temperance Association and a vice-president of the Society for the Study of Inebriety. Dr. Williams was an ardent upholder of the legal rights of the medical profession against the quack and impostor, contributing on the subject to our columns at the time of the Medical Acts Amendment Bill of 1867. Joining the Salvation Army in 1885, he held for 27 years the position of honorary director of the medical department at the International Headquarters in Queen Victoria-street, London, with the rank of lieutenant-colonel in the organisation.

CENTRAL MIDWIVES BOARD.—A meeting of the Central Midwives Board was held at Queen Anne's Gate Buildings, Westminster, on May 10th, with Sir Francis H. Champneys in the chair. A letter was considered from the National Association for the Prevention of Infant Mortality and for the Welfare of Infancy transmitting a copy of a draft circular prepared jointly by the Midwives Institute and the Committee of the Association, with the view of assisting practising midwives in promoting breast-feeding, and expressing the hope that permission may be given for the publication of the circular with an expression of the approval of the Board. The Board decided that the reply be that the Board gives its general approval to the circular of the National Association for the Prevention of Infant Mortality and for the Welfare of Infancy on Breast-feeding with the exception of the note at the end and has no objection to the publication of the circular with an expression of this general approval.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Capt. F. Hunton, R.A.M.C., attached Northumberland Hussars Yeomanry, received his medical education at Newcastle-on-Tyne, and qualified at Durham in 1891. Prior to joining the R.A.M.C. he was in practice at Sedgefield, Ferry Hill, in which district he held several appointments.

Died of Wounds.

Capt. G. S. Blandy, M.C., R.A.M.C., qualified at Edinburgh in 1902, and was medical officer at Napsbury Asylum previous to joining up. He formerly held appointments at the Norfolk and Norwich Hospital and at the Scarborough Hospital, and was for some time assistant medical officer at the Norfolk County Asylum at Thorpe. The award of the M.C. was announced in THE LANCET of June 10th, 1916, p. 1195.

Capt. J. Ewing, R.A.M.C., attached Royal Welsh Fusiliers, was educated at Leeds and qualified in 1903. Prior to joining up he was in practice at Leeds.

Died.

Major C. Ryley, R.A.M.C., was a student at St. Mary's Hospital, London, and qualified in 1901. After holding appointments at Paddington Green Children's Hospital and at St. Mary's Hospital, he joined the R.A.M.C. in 1904 and saw service in China and Bermuda. He went to the front in the middle of last year and contracted pericarditis, from which he died.

Capt. C. B. Burden, Australian A.M.C.

Wounded.

Capt. R. M. Alcorn, R.A.M.C., attached Northumb. Fus.
Capt. J. D. Marshall, R.A.M.C., attached Suffolk Regiment.
Capt. C. F. Searle, R.A.M.C., attached Northampton Regt.
Capt. O. C. S. Tandy, R.A.M.C., attached Seaforth High.
Lieut. J. Young, R.A.M.C., attached Gloucester Regiment.
Capt. P. E. Voss, Australian A.M.C.
Capt. I. D. Dickson, R.A.M.C.
Lieut. G. E. Spicer, R.A.M.C.
Capt. F. R. Armitage, R.A.M.C., attached R.F.A.
Capt. E. W. Adcock, R.A.M.C., attached E. Yorks Regiment.
Lieut. L. Kilroe, R.A.M.C.
Capt. J. M. Moyes, R.A.M.C.
Capt. H. G. Hobson, R.A.M.C., attached R.F.A.
Capt. E. S. Cuthbert, R.A.M.C., attached Middlesex Regt.
Capt. E. C. Gimson, D.S.O., R.A.M.C., attached E. Surrey R.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Lieut. E. B. D. Brunton, Middlesex Regiment, only son of Dr. C. E. Brunton, of Walthamstow, London.
Second Lieut. J. Newton, H.A.C., younger son of the late Dr. W. T. Newton, of Lakenheath, Suffolk, and formerly of Goswell-road, London.
Second Lieut. J. C. Orr, Royal Berkshire Regiment, second son of Dr. W. R. Orr, of East Finchley, London.
Major J. H. Clapperton, Royal Field Artillery, third son of the late Dr. J. Clapperton, of Broughton, Hants.
Capt. T. S. King, East Surrey Regiment, only son of the late Dr. T. R. King.
Second Lieut. G. W. Clapham, Royal Field Artillery, second son of Mr. L. Clapham, M.R.C.S., of Thorney, Peterborough.

THE HONOURS LIST.

The following awards are made in connexion with the engagement between H.M.S. *Swift* and *Broke* and a flotilla of German destroyers on the night of April 20th–21st:—

Distinguished Service Cross.

Surg.-Prob. Christopher Thomas Helsham, R.N.V.R. (*Broke*)
Surg.-Prob. John Sinclair Westwater, R.N.V.R. (*Swift*).

Worked with great energy and ability in attending to the wounded.

The following award is also announced:—

Military Cross.

Capt. Stanley Sextus Barrymore Harrison, R.A.M.C., attached South Staffordshire Regiment.

For conspicuous gallantry and devotion to duty. He worked continuously for 10 hours under very heavy fire, and was responsible for saving many lives. He displayed great courage and determination throughout. He has on many previous occasions done fine work.

THE PARIS CONFERENCE ON THE WAR CRIPPLE.

The Conférence Interalliée pour l'Étude de la Rééducation Professionnelle et des Questions qui Interessent les Invalides de la Guerre was held in Paris, in the Avenue d'Antin side of the Grand Palais, from May 8th to 12th. That all sections of French society realise the national importance of the questions to be discussed was shown by the presence of labour leaders, socialists, heads of industrial concerns, agricultural syndicalists, lawyers, and deputies, as well as members of the medical and military professions and a fair sprinkling of disabled soldiers.

Delegates.—Official delegates were sent by each of the Allied Governments. The British delegates were: Lieutenant-Colonel Sir Arthur Griffith-Boscawen, M.P., Parliamentary secretary to the Ministry of Pensions; Major-General Russell (representing Sir Alfred Keogh); Sir Charles Nicholson, M.P., chairman to the Disablements Subcommittee of the London War Pensions Committee; Colonel E. A. Stanton, C.M.G., of the Statutory Committee; Colonel Stewart, representing the British Red Cross Society; Lord Charnwood, Comité Anglo-Belge; Lieutenant-Colonel Sir Berkeley Moynihan, C.B., M.S., F.R.C.S., R.A.M.C.; Major Robert Mitchell, Adviser to the Minister of Pensions on Training; Fleet-Surgeon Percy H. Boyden, R.N.; and Lieutenant-Colonel Finlay, C.A.M.C., and Captain C. McClure, C.A.M.C., representing Canada. The English members attending the Conference were Lieutenant-Colonel Sir Thomas Oliver, Colonel J. Wallace, Colonel J. Cowen, Colonel J. Reed, and Mr. Samuels.

Organisation.—The Conference was organised by a Franco-Belgian committee under the presidency of Baron de Brocqueville, the Belgian Minister of War; M. Léon Bourgeois, the French Minister of Labour; M. Justin Godart, head of the French Army Medical Service; and M. Roden, Under Secretary of Labour; and was formally opened on Tuesday, May 8th, in the presence of the President of the French Republic. The members were divided into six sections, classified by the questions to be discussed and meeting at the same time in different rooms. While this plan facilitated the covering of much ground in a short time the drawback was only seen at the general meeting of all the sections at the end of the Conference, when it was found that the questions discussed were so interrelated that not only had it been possible for some of the sections to arrive at different conclusions as to the same subject, but that three or four had made the same recommendation in different terms. Since many of the 80 decisions voted will have to be re-edited to avoid repetition, it was finally decided not to publish any of them for the present. Some of the most important points dealt with may, however, be noted.

Work of Sections.—The first section, presided over by Senator Mélis, Inspector-General of the Belgian Medical Service, discussed physical re-education from the point of view of—(*a*) physiotherapy and medical gymnastics; (*b*) artifical limb appliances; and (*c*) work as an agent of physical restoration.

(*a*) The Belgian school of treatment, voiced by Dr. Marneffe, director of the Belgian Military Hospital of Bonsecours at Rouen, is in favour of Swedish methods of gymnastics and massage, and inclined to the use of mecano-therapic apparatus of the Zander type. This view was not shared by the majority of his colleagues, and it was decided to develop on lines not necessarily Swedish. The omission of any paper on X ray and hot-air treatment was commented upon by M. Laborde and Dr. Zimmern. "La gymnastique médicale" applied to men suffering from lung wounds was advocated by Dr. Philippe Tissié, of Pau, and an interesting paper by Dr. Schaer, of the Hôpital du Grand Palais, demonstrated the cure of muscular contraction in less than 15 days by a course of "mobilisation rééducative." Dr. Larat and Dr. Billiard insisted on the importance of electro-diagnosis in nerve wounds, particularly in view of the patients' future, as they must be enabled to work while undergoing treatment.

(*b*) The question of prothesis is a complex one in France, but as the difficulty is more or less a domestic one it does not greatly affect the other Allies, and the recent establishment of a Commission by the Service de Santé will doubtless solve the problem. Professor Putti, of Bologna, upheld the employment of the so-called "American" artificial limb, but many of the French surgeons prefer their own types. Some of these are very much cheaper than the English ones, but it is not yet possible to judge of their lasting qualities.

(*c*) Sir Berkeley Moynihan briefly described the system for orthopædic treatment of the wounded in the British Isles. He pointed out that many of the conditions now

needing treatment could be prevented by timely attention to sound principles. Joints in which ankylosis was inevitable could be fixed at better angles. Joints whose nerve-supply was severed might be kept supple, and tendons might be spared the overstretching of their fibres, from which recovery was so difficult. The various forms of treatment at orthopædic centres and in "curative workshops" attached to them necessitate constant control by the surgeon. Instruments of the Zander type were chiefly useful when looked upon either as mechanisms to be worked by the injured member rather than as a means whereby joints were quietly rocked by the agency of a sound limb, or as preparatory to or auxiliary to those purposeful exercises in which the patient had something to see and show as a result of his labours. The importance of the fact that a man's mind as well as his muscles should be engaged in the task of restoring function was pointed out. In the curative workshops a patient quickly regained self-reliance when he found himself once more a useful working member of society.

The chances open to the discharged disabled soldier in the labour market were discussed, and the relations of the Pensions Ministry to these problems briefly reviewed. The paper ended with a tribute to the constant help given to orthopædic work by the British Red Cross Society and by their representative, King Manuel of Portugal.

Among the suggestions made in Section I. were several concerning the class of agricultural labourers, which is far larger in France than in England. It was felt that any organisation to further functional restoration by means of agricultural work should pay great attention to special conditions of each region, and not form any stereotyped plan. It was also pointed out that (1) any work undertaken as auxiliary to physio-therapic treatment should be chosen by the medical director and remain under his close surveillance; (2) such work should be made obligatory in all physio-therapic institutions; (3) schools for functional restoration should be placed under the single control of the Service de Santé; (4) schools for professional re-education should be directed by a committee representing (*a*) medical men, (*b*) employers, (*c*) skilled workmen, (*d*) labour unions.

A paper was read by Captain C. McClure describing the treatment given at the Canadian Hospital at Ramsgate, and another on Les Appareils de Prothèse was sent in by MM. Rieffel and Gourdan.

Section II.—In this section, presided over by Dr. Bourillon, the director of the well-known Institut National Professionnel des Invalides de la Guerre at St. Maurice, there was much discussion as to whether the doctor or the instructor should have more authority over the disabled. The opinion was expressed that doctors should direct the industrial work and teachers should execute it. A Portuguese delegate opposed this idea on the ground that, generally speaking, doctors were not sufficiently trained to carry out the education of the maimed, but should limit themselves to advising what kind of work they could do. Mistakes had been made, and men had been obliged to change their occupation. In view of the fact that overcrowding in one trade in certain localities may occur, as at Bordeaux, where the majority of the disabled have chosen commercial occupation, an inquiry was advised as to the losses sustained through the war in each trade, so that an equilibrium may be maintained in filling the gaps. Men wishing to take up a non-manual occupation should be examined as to capacity. It was also pointed out that there was a wide field for training men in the mechanism and working of agricultural motor tractors, which can be used all the year round in the French and Belgian villages for different purposes. The establishment of a permanent inter-Allied committee to keep in touch with and disseminate news of the work done for the disabled in all the Allied countries was voted for in this as well as in several other sections.

Section III.—This section, under Senator Bérenger and Sir Thomas Barclay, discussed the placing of the disabled in civil life. Here, again, the different conditions obtaining in England and France gave this problem rather a personal flavour. The creation last year of l'Office National des Mutilés et Reformés de la Guerre, under the joint direction of the Ministries of Labour, War, and Interior, does not seem to have smoothed out all difficulties, since one of the changes most ardently demanded in this section was unification of the employment bureaux for agriculture, industry, and commerce, the same bureau to serve both for disabled and valid men. Even though France, having had a greater number of men first in the field, and consequently a greater number of casualties, has felt the pressure of this problem before England, the opinion of the section seemed to be that it had been more carefully thought out in England. Lord Charnwood explained the English expedient of the creation of a Ministry of Pensions to solve this difficulty instead of leaving it to be shunted about between three Ministries as in France. Another point commended by the French members of this section was the creation by the Ministry of Labour at the request of the Ministry of Pensions of joint committees of masters and men to settle such questions as rates of pay for the disabled. Lord Charnwood also explained that local organisations under the Ministry of Pensions have been constituted to deal with all the various requirements now occupying the attention of this section. One of the duties of these local committees in the neighbourhood of a hospital is to get in touch with the men before they are discharged and do everything possible in the way of interest and influence to help them to make the best of their lives The French members, who are keenly alive to the difficulty of dealing with men whose mental outlook has been affected either by their sufferings or by the enervating conditions of hospital life, were particularly appreciative on this point.

Section IV.—This section was concerned with the economic and social interests of the disabled. Among the papers read and discussed was one by the President of the Section, General Malleterre, who advocated the reorganisation of the Hôtel des Invalides for the reception of a number of war pensioners incapable of earning their living. The report prepared by Major Robert Mitchell pointed out the results of the system recently adopted in England—that the ultimate decision as to his future was left to the man himself; that instruction was given according to the needs of the different localities; that institutional workshops had been created specially for men incapable of competing with valid men, &c. The section voted for the creation in the other Allied countries of such special workshops as those existing in England.

Section V.—This section met to discuss the difficulties of the blind, the deaf, and the nerve cases. Under the presidency of M. Brieux, of the Académie Française, several interesting votes were taken after discussing papers by Dr. F. Chavanne de Lyon, Médecin-Major Jean Camus, Médecin-Major Roussy, and others. Among the measures voted for were those concerning the pre-re-education, the re-education, and the return home of the blind soldier. As far as possible it is proposed to carry out the treatment of the blind on the lines first laid down by Saint Louis when he founded the Hospice des Quinze-Vingts and allowed his blind beggars to live there with their families. Husbands and wives are not to be separated, but lodgings are to be found for them near their work.

Section VI.—The work of this section was concerned with the documentation and propaganda of matters relating to the disabled. Here, too, a vote was given for the formation of a permanent Central Inter-Ally Committee to hold all documents and information as to steps taken in different countries at the disposal of inquirers. The greatest interest was shown by the President of the section, M. Honnerat, and the other members in the accounts of English methods of dealing with the return of the disabled soldier to civil life, and especially the liberal financial provisions for men undergoing training and treatment, given by Sir Arthur Griffith-Boscawen and Sir Charles Nicholson, who had concisely detailed the measures taken by the Government in the questions of pensions, re-education, &c. The published report made by Sir Alfred Keogh, and included in the brochure of the collected reports which had formed the basis of the discussions, was studied by the members of all sections. The following resolutions were passed at the last meeting of the section:—

1. That since the question of the disabled as to pensions, professional re-education, placing, and social protection is common to all the countries of the Entente, and that it is to the interest of each of these countries to seek a solution that will be the logical result of the experience gained; that since this result can only be obtained by the organisation of an inter-allied bureau of documentation in the matter; that while waiting for the creation of such bureau through the coöperation of the Governments interested, the Direction of the General Statistic Department of France be at once charged to gather such documents with a view to publishing and communicating to Allied countries such details on each question as may be asked.

2. (*A*) That an active and coördinated propaganda should be organised in each of the Allied countries by tracts, addresses, lantern

lectures, meetings, &c.: (1) To make known in all parts of the country the resolutions adopted by the Inter-Allied Conference; (2) to make the disabled understand the reasons that determined these resolutions, as well as the advantages to be gained for them and for the country; and (3) to combat opposition tendencies and open or secret opposition propaganda. (*B*) That in order to facilitate professional re-education (1) the authorities undertake the expense of this re-education as well as the maintenance of the disabled man and of his family during the course; (2) that a special propaganda should be carried out among the doctors and nurses of hospitals as well as in the institutions for re-education with a view to accentuate their effort to persuade the disabled to fit himself for work according to the resolutions of the committee with due attention to the normal outlets in each region. (*C*) That a permanent inter-Allied committee should be instituted to maintain the bonds that have been created by the Conference between the institutions and the people who have shared in the work and prepared the ulterior meetings.

Exhibition.—Not the least interesting part of the Conference was the exhibition arranged in the galleries of the Grand Palais showing (1) charts, statistics and photographs of the different institutions for the disabled; (2) artificial limbs used in re-education, arms and hands for work purposes, instruments and tools adapted for use by the disabled; (3) inventions, games, modifications of tools and ingenious methods of relieving the helplessness caused by the loss of limbs. All the exhibits belonging to the French Army Medical Service or the institutions under its control are to be removed to the permanent war medical and surgical museum now installed in the Val-de-Grâce, and the manufacturers of the different prothesis appliances are to be asked to add where possible specimens of their work.

The proceedings of the Conference were varied by the visits of inspection paid by the members to the École d'Agriculture at Grignon, to the École Nationale de Ré-éducation at St. Maurice, and to the Belgian School for the disabled at Port Villez.

From the English point of view the great value of the Conference was confirmatory. Where methods sometimes differed slightly it was seen that each country was moving largely along the same lines only varied by local conditions. Many phases of the English problem differ from the French owing to the fact that the agricultural question is so much more important in France, where 40 per cent. of the men mobilised and 37·5 per cent. of the disabled belonged to the agricultural class.

While the French system of keeping the disabled under military authority until a complete cure is effected does away with the difficulty of after-treatment, in the matter of professional training they have to cope with the same difficulties.

Many of the discussions that took place were more or less of a domestic character, but the Portuguese, Serbian, Russian, Italian, and British members of the Congress listened to the Belgian and French problems with an interest which was, as M. Léon Bourgeois expressed it in his opening speech, a sign of "solidarité morale" among the Allies.

THE UNITED STATES AND MEDICAL ORGANISATION FOR THE WAR.

Hospital Staffs.—The Hospital Committee of the Council of National Defence has recommended general hospitals throughout the country, having a capacity of 100 beds or over, to reorganise their staffs in order to allow every available man to join the Medical Reserve Corps of the Army and Navy. The men selected to remain with their home hospitals will wear a badge to indicate that they are performing indispensable home service. The suggestion has been made to draw up a list of all available hospital accommodation at convenient points along the Atlantic and Pacific coasts and of special facilities for the treatment of neurological, orthopædic, and shell-shock cases.

Hospital Units for France.—Six base hospital units have been organised and notified to hold themselves in readiness to be sent to France within the next few weeks. They will be in charge of Dr. G. E. Brewer, Dr. George W. Crile, Dr. Harvey Cushing, Dr. Richard H. Hart, Dr. Frederick Besley, and Dr. Frederick T. Murphy. American surgeons for service with the Army in France will go as members of the medical corps of the United States Army. Each hospital unit consists of 23 medical men, 2 dentists, 65 nurses, and 150 enlisted men of the medical department. In addition to these units, which are each capable of attending to 500 men, the statement is again made that 1000 American surgeons are ready to put themselves at the disposal of the Allies in Europe.

The Supply of Medical Men.—As in this country, the question of emergency alterations in the medical curriculum is being considered. At a recent meeting of the General Medical Board of the Council of National Defence the question of keeping the medical schools of the country in continuous operation was discussed, and the State Boards of Medical Registration were asked to consider the recognition of the "continuous teaching plan" as an equivalent of the usual four-year course, as well as the recognition of various forms of substitute work.

THE EXCHANGE OF INVALID PRISONERS OF WAR.

A certain number of prisoners of war, both British and German, have been repatriated from their internment in Switzerland, but a good deal of disappointment is felt in this country that the number has been so small. Mr. Hume-Williams, whose question in the House of Commons gave expression to this feeling, evoked the reply from Mr. J. F. Hope, the representative of the War Prisoners Department, that the qualification for exchange from internment in Switzerland is the same standard of physical disability as that demanded in the case of men repatriated direct from prisoners' camps. This standard, as we saw in THE LANCET of April 29th and June 10th, 1916, is a high one, although it is not so high for men in the ranks as for officers. The loss of a limb in an officer, whether commissioned or non-commissioned, renders the prisoner eligible only for internment in Switzerland, whereas privates similarly mutilated are repatriated. Mr. Hope thought it unlikely that many of our interned men will qualify for repatriation under the present rules. As this would involve a considerable increase in disability, we can hardly wish them to do so.

THE TREATMENT OF MEN DISCHARGED FROM THE ARMY ON ACCOUNT OF NEURASTHENIA.

Provision is being made for the institutional treatment of men discharged from the Army on account of neurasthenia, shell shock, and allied nervous conditions, at a branch hospital attached to the Hospital for Epilepsy and Paralysis, Maida Vale. This hospital was founded 50 years ago for the treatment of a class of patient whose needs up to the present time have not been recognised by the State, and has accepted the responsibility for the treatment of functional nervous disorders arising in civil and industrial life. Since 1896 an attempt has been made with some success to act as third party between employer and employee under the Workmen's Compensation Acts. Light employment is the great desideratum for these cases, but in industrial life there is great difficulty in finding the suitable milieu to enable them to become fit or hardened before returning to employment. In the Army this need has been met by the institution of Command Depôts. A man broken by strain is more likely to break down when subjected to similar strain than when put to a changed mode of life, and experience has shown that cases of nervous breakdown previously engaged in professional or clerical work do well when sent to sea or on taking up farm work. The exigencies of the Service do not permit of such consideration of the individual being given prior to discharge, and hence invaliding is a necessary stage in the recovery of the neurasthenic. This has been recognised in the recent Military Service Revision Act, which excludes from its operation men suffering from functional nervous disorders. These pensioners nevertheless require an environment suitable for the restoration of their mental powers, which demands suitable oversight and stimulating interests. A careful study has to be made of the previous life, interests, and ability of the patient, as well as of the stock from which he came. At "Highfield," Golder's Green, the new branch of the Maida Vale Hospital, only selected cases of patients suffering from functional nervous disorders are to be admitted. The institution occupies the buildings of a former well-known girls' school, and contains accommodation for 150 persons, including 35 single-bed wards. A gymnasium is provided, surrounded by large well-wooded grounds. The facilities offered include: (1) Isolation beds with provision for local and general massage, and the application of modern electro-therapeutic treatment; (2) a gymnasium equipped for physical drill and Swedish exercises; (3) a range of workshops; (4) organised games with instructors;

(5) personal contact with a trained staff; (6) an employment bureau and after-care in conjunction with the Local Pension Committee. Generous terms have been granted by the Ministry of Pensions, so that all who enter the hospital will receive a pension, while the wives and children of married men draw separation allowance.

THE Naval Hospital, Truro, has received the sum of £50, being a portion of $500,000 recently raised by means of a bazaar at Chicago.

THE President of the French Republic has appointed Surgeon J. D. Milligan, R.N., to be a Chevalier of the Legion of Honour.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

Surgeon-General William H. Norman, C.B., has been appointed to succeed Surgeon-General Sir Arthur W. May, K.C.B., as Director-General of the Medical Department of the Navy from June 1st, 1917, and has been granted the relative rank of Vice-Admiral.

Surgeons to be Staff Surgeons: H. F. Briggs, M. P. Fitzgerald, A. G. Malcolm, H. C. Devas.

To be temporary Surgeons: M. McKerrow, R. N. B. McCord, S. L. Higgs, and A. J. Muirhead.

The following appointments have been notified:—Fleet-Surgeons: R. M. Richards to *Powerful*; R. F. Clark to *Vivid*; and C. J. H. Cock to *Suffolk*. Staff Surgeons: D. H. C. Given and R. M. Riggall to *Donegal* and *Hearty* respectively. Surgeon: P. B. Wallis to Portland Hospital. Temporary Surgeons: A. P. Barrett, F. G. Lloyd, and K. H. McMillan to *Victory*; R. N. B. McCord to Haslar Hospital; M. McKerrow to Chatham Hospital.

ARMY MEDICAL SERVICE.

Lieut.-Col. C. H. Hawkins to be temporary Colonel whilst holding the appointment of Assistant Director of Medical Services.

Lieut.-Col. A. L. A. Webb, C.M.G., to be an Assistant Director-General (temporary).

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. H. J. Hargrave, Suffolk Regiment (T.F.), to be temporary Lieutenant-Colonel.

To be acting Lieutenant-Colonels whilst in command of a Field Ambulance: Majors: E. E. Powell, H. W. Russell, and A. W. Gibson. Captains: T. J. Mitchell, J. W. L. Scott, and G. P. Taylor.

To be acting Lieutenant-Colonels whilst in command of a General Hospital: Majors J. G. Foster, J. F. Whelan, and Capt. C. H. H. Milner (T.F.).

The undermentioned are granted temporary rank: As Lieutenant-Colonel: S. H. Taylor, A. R. Parsons. As Major: W. A. Winter, R. C. B. Maunsell, K. E. L. G. Gunn. As Captain: W. Boxwell, C. E. Boyce, F. H. Mc C. Crawley, E. J. M. Watson.

Temporary Majors to be temporary Lieutenant-Colonels whilst employed at hospitals as stated: H. W. Bruce, Southwark Military Hospital; J. H. Brooks, Mile End Hospital; W. D. Buncombe, City of London War Hospital; W. Scatterty, Keighley War Hospital; F. S. Toogood, Lewisham Military Hospital.

Temp. Hon. Capt. M. Gamble to be temporary honorary Lieutenant-Colonel whilst serving with Withington War Hospital.

Major (Brevet Lieut.-Col.) H. J. Crossley to be acting Lieutenant-Colonel whilst in command of a Stationary Hospital.

Captains, R.A.M.C. (T.F.), to be temporary Majors: L. G. Parsons, G. P. Mills.

Capt. B. Biggar is seconded for service with Egyptian Army.

To be temporary Majors: W. A. Brend, F. L. Collie, J. Kerr, W. D. Knocker, Temp. Capt. H. F. Woolfenden, and W. E. N. Dunn (whilst employed at the Horton (County of London) War Hospital).

To be temporary Captains: Temp. Lieut. P. C. E. d'E. Wheeler and Temp. Lieut. G. de B. Turtle.

To be temporary Honorary Lieutenant: C. E. Fearn.

To be Lieutenants: V. T. Borthwick Yule and A. G. Lumsden (from Aberdeen University Contingent, O.T.C.), R. Lloyd-Jones and W. Christopher.

Officers relinquishing their commissions: Capt. T. E. Roberts (on account of ill-health caused by wounds; granted the honorary rank of Captain) and Temp. Lieut. D. E. H. Cleveland.

The undermentioned officers of the Canadian Army Medical Corps are appointed as follows:—Col. H. A. Bruce is seconded for service with the British Medical Services as a Consultant Surgeon.

To be temporary Colonels: Temp. Col. G. E. Beauchamp, Temp. Lt.-Col. H. A. Onisholm, D.S.O., and Temp. Lt.-Col. H. A. Bruce.

To be temporary Lieutenant-Colonels: Temp. Maj. W. T. Connell, Temp. Maj. J. R. Spires, Temp. Lt.-Col. K. D. Panton, Temp. Maj. C. H. Reason (while specially employed).

To be temporary Majors: Temp. Capt. J. N. Gunn, Temp. Maj. G. E. Gillies, and Capt. T. H. McKillip, D.S.O.

Temporary Captains to be temporary Majors: G. H. Kidd, S. M. Polson, W. H. Ballantyne, J. P. Quigley, G. A. Platt, W. F. Nicholson, and N. J. Barton.

G. W. Badgerow to be temporary Honorary Major.

To be temporary Captains: C. A. Yates, J. W. Begg, Temp. Capt. F. H. H. Mewburn, F. X. O'Connor, G. E. Millette, C. G. Main, A. D. Campbell, C. R. Wallace, Temp. Lieut. R. H. Bonnycastle, Temp. Lieut. E. V. Frederick, and Temp. Lieut. G. S. Gordon.

To be temporary Lieutenants: C. A. Brisco, B. E. Scott, C. M. Keiller, R. B. Martin, M. E. Gorman, H. W. Whytock, D. A. Murray, H. McKinnon, W. J. Bell, A. R. Mann, and L. D. Orr.

Temp. Maj. J. N. Roy resigns his temporary commission.

The undermentioned officers of the Canadian Army Dental Corps are appointed as follows: Temporary Captains to be temporary Majors: J. E. Holmes, W. J. Bentley, W. R. Greene, A. E. Mullin, G. N. Briggs, L. N. Trudeau, G. H. A. Stevenson, J. F. Blair, G. S. Cameron, C. E. Brown, and O. A. Elliott.

To be temporary Captain: L. R. Dufresne.

To be temporary Lieutenants: A. C. Steele, J. W. McDonald, and A. G. Lough.

SPECIAL RESERVE OF OFFICERS.

Lieutenants to be Captains: G. H. Barry, C. P. L. Carrier, F. G. L. Dawson, R. R. Scott, M. C. Cooper, D. H. Anthony, J. J. Murphy, and A. G. Harsant.

To be Lieutenants: D. C. Beaumont, C. V. Pink, H. W. Leetham, W. G. Woolrich, J. E. Carpenter, E. B. Andreae, A. G. E. Wilcock, J. B. S. Lewis, and T. Hawke McLeod (from the University of London Contingent O.T.C.), C. C. Chesterman (from Bristol University Contingent O.T.C.), and J. C. Collins.

TERRITORIAL FORCE.

Captain J. D. Allen, from Territorial Force Reserve, to be Captain.

Major D. L. Fisher to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Major D. W. Patterson to be acting Lieutenant-Colonel whilst holding the appointment of Administrator.

Captain W. T. Harkness to be acting Major whilst holding the appointment of Registrar.

The undermentioned Lieutenants to be Captains: A. C. Bescoby and M. Wilson.

To be Lieutenant: J. H. Churchill (from Territorial Force Reserve).

VOLUNTEER FORCE.

H. Chadwick, 11th Battalion, Lancashire Volunteer Regiment, to be temporary Captain and Medical Officer.

NEW MEDICAL LEGISLATION IN SOUTH AFRICA.

A South Africa Correspondent writes as follows: The Union Government has introduced a Medical, Dentistry, and Pharmacy Laws Consolidation Bill into the South African Parliament, and at the time of writing it has passed a second reading in the Senate and been referred to a Select Committee of that House. The Bill was introduced into the Senate by the Minister of the Interior (Sir Thomas Watt), who moved its second reading on March 19th. The Bill is styled a Bill for the purpose of consolidating and amending the laws in force in the Union relating to medical practitioners, dentists, chemists and druggists, midwives, and trained nurses; the keeping and sale of poisons; the importation, sale, and use of habit-forming drugs; and other matters relating thereto. It was introduced first in the Senate, and not, as is usual, in the House of Assembly. Sir Thomas Watt said that the Bill was intended to protect the public and the profession against improperly qualified practitioners, and also to apply the principle of reciprocity as between the Union of South Africa and other countries granting medical degrees and, of course, recognising the medical diplomas granted by British universities. There was nothing in the Bill to prevent storekeepers in South Africa from selling sheep dips or even patent medicines, provided that there was no chemist within five miles. Any storekeeper could, of course, sell patent medicines that did not contain poison. The farmers' coöperative societies would be allowed to sell certain poisons to their members. Dealing with novel features of the Bill, Sir Thomas Watt said that a new principle had been introduced, to the effect that the seller of poisons must add a leaflet showing the antidotes to such poisons should they be taken in mistake. Restrictions were placed by the Bill on the sale of drugs producing evil habits. A difficulty had arisen in dealing with "dagga" smoking amongst the natives, as the herb grew wild in many parts of the Union. One subject dealt with in the Bill was the grievance that some medical practitioners who could practise in the Orange Free State and the Transvaal were debarred from doing so in the Cape and Natal, owing to the absence of reciprocity respecting foreign diplomas and degrees. The South African Union was making arrangements for a three-year medical course, and in due time, the Minister said, they would have a full medical course in South Africa. At present the course had to be completed elsewhere. The registration fee for a medical practitioner, £25, was rather high, but the wish was to make the Medical Council self-supporting. A pharmacist would pay £12 10s. Sir John Fraser thought that the Government should schedule in the Bill foreign diplomas which would not be accepted. Sir Meiring Beck, replying to the suggestion of scheduling, said that medical schools were changing every day. They could not, therefore, adopt a cast-iron system, but must adapt themselves to change of circumstances. He pointed out that the Medical Council of Great Britain, which had worked smoothly for many years, was constituted exactly as that proposed in the Bill.

Dr. E. Graham Little has been elected by his fellow graduates in medicine and surgery of the University of London to fill his fourth term of office (1917–1921) as their representative on the Senate of the University.

Correspondence.

"Audi alteram partem."

THE TREATMENT OF AMŒBIC DYSENTERY.

To the Editor of THE LANCET.

SIR,—In your issue of July 29th, 1916, you published a note by me on Treatment of Carriers of Amœbic Dysentery, in which I gave reason for supposing that the double iodide of emetine and bismuth would be useful in such cases, and recorded some preliminary results obtained by those who were giving the suggestion a clinical trial. Since then several reports have been published on the action of this compound, and these have, on the whole, so strengthened the preliminary impression formed of its probable value that its use, at any rate in the immediate future, seems likely to be extensive.

My own connexion with the matter has been slight, but I appear to be primarily responsible for a historical injustice, the rectification of which is my object in writing to you now. My note of July, 1916, referred to a paper published in 1915 by Du Mez, in which the double iodides of emetine with bismuth and with mercury were described, and their use suggested to ensure the passage of emetine through the stomach and its gradual liberation in the intestine. I was at that time quite unaware of the fact, which Du Mez also had evidently overlooked, that a compound of this kind had been prepared as long ago as 1891 by the late Major Warden, I.M.S., and an account of its use in the treatment of dysentery published in the same year by Surgeon-Captain Tull Walsh, I.M.S. (now Lieutenant-Colonel, retired) in the *Indian Medical Gazette* (vol. xxvi., p. 269, 1891). The "emetine" of those days was an impure mixture of the alkaloids of ipecacuanha, and the differentiation of amœbic from bacillary dysentery was then still a matter of dispute. But by careful clinical observation of cases of "acute dysentery" Captain Walsh established two points: firstly, that the curative effect of ipecacuanha in dysentery was due to its alkaloids (the "emetine" of that date), the drug being inert when freed from these completely; and, secondly, that the "emetine" could be effectively administered for this purpose by the mouth in the form of its double iodide with mercury. In the one case he clearly anticipated the discoveries made 20 years later by Vedder and by Rogers, though the intervening development of chemical and protozoological knowledge gave a greater precision to their observations; in the other case he even more definitely anticipated, by a quarter of a century, what we have been regarding as a recent development of the emetine treatment.

I need hardly point out that this acknowledgment affects only my own small and secondary share in the introduction of emetine bismuthous iodide into practice, and in no degree affects the credit due to those whose patience and skill, whether in ward or laboratory, have demonstrated the value of this compound in conditions which the hypodermic method often fails to cure. Their work has, of course, been largely concerned with infections which the methods of 1891 could not have detected at all.

I should add that Colonel Walsh has had no part in this attempt of mine to repair the injustice of failing to mention his observation of so many years ago. I wrote to him when I discovered it; and, in a letter of most kindly encouragement which he sends me in reply, he expresses his own attitude as follows: "So long as good work is done I do not care who does it."

I am, Sir, yours faithfully,

May 7th, 1916. H. H. DALE.

BLACKENING OF TETANUS CULTURES.

To the Editor of THE LANCET.

SIR,—In your issue of May 5th Mr. R. S. Adamson and Mr. D. W. Cutler in their paper, entitled "Note on a Bacillus resembling *B. tetani*," quote my statement that *B. tetani* produces blackening in meat medium. I should be glad if you would allow me the courtesy of your columns to correct this statement which is an error on my part. The tetanus culture which I described was later found to be contaminated with a proteolytic organism. At the time of writing, although I was alive to the difficulty of obtaining anaerobes in pure culture from wound material, I was not prepared to find that the same difficulty would arise in dealing with laboratory tetanus cultures of long standing. The reactions of this impure culture agreed with the account of *B. tetani* given by v. Hibler and with that of v. Lingelsheim in Kolle and Wassermann's edition of 1912. I am engaged in investigating various tetanus cultures, with results which will be published in due course. I am not at present quite prepared to state what the cultural reactions of a pure tetanus culture are, but I have found that tetanus cultures, when freed from this foreign proteolytic organism, do not cause blackening of the meat medium.

I am, Sir, yours faithfully,

MURIEL ROBERTSON.

Lister Institute of Preventive Medicine, Chelsea, S.W., May 9th, 1917.

WHOLE-TIME APPOINTMENTS AND THE POSITION OF TEMPORARY MEDICAL OFFICERS IN THE NAVY OR ARMY.

To the Editor of THE LANCET.

SIR,—Since August, 1914, a number of vacancies caused by death or resignation has occurred in the Public Health Service. At many places temporary appointments only have been made, and the posts are to be advertised and duly filled up permanently when this great war is at an end and competition will be unrestricted.

However, some whole-time places have been permanently filled by men "on the spot." Is this fair or just to those who have joined up to serve our King and country and so have no chance of competing for these posts?

There is no credit attached to men who obtain places for which probably they would have had no selection if pre-war conditions existed, and they had had to range themselves against men better qualified for important work than these interlopers are.

I hold strongly that the Local Government Board ought not to penalise patriotism by approving any appointments in the public health or school medical or Poor-law medical services except temporarily and only for the duration of the war. I have reason to know that this neglect of their interests is giving rise in certain instances to considerable dissatisfaction amongst medical men serving abroad.

I am, Sir, yours faithfully,

May 7th, 1917. "FAIR PLAY."

Medical News.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At a meeting of Comitia of the Royal College of Physicians of London on April 26th and of the Council of the Royal College of Surgeons of England on May 10th, diplomas of L.R.C.P. and M.R.C.S. were respectively conferred upon 103 candidates—93 men and 10 women—who have passed the Final Examination of the Conjoint Examining Board and have complied with the by-laws of each College. The following are the names and medical schools of the successful candidates:—

Gustave Adler, London; Ewart Gordon Anderson, New Zealand and London; Eric Burn Andrese, Otago and London; Philip Ardern Ashcroft, Manchester; Eric Victor Beale, Cambridge and London; Douglas Charles Beaumont, Cambridge and London; Wilfrid Thomas Beswick, Cambridge and St. Thomas's; Alethea Josephine Bolton, Birmingham; Alfred Octavius Bolton, St. Bartholomew's; Alfred Henry Boon, Chicago; Marian Noel Bostock, St. George's and Royal Free; Ernest William Bowell, Guy's; James Bassett Brash, Cambridge and St. Bartholomew's; Israel Braun, St. Bartholomew's; Edward Davenport Broster, Cambridge and University College; Donald Cameron, St. Bartholomew's; Oliver St. Leger Campion, Guy's; James Edwin Carpenter, London; Kathleen Lydia Cass, Manchester; Harold Chadwick, Cambridge, St. Bartholomew's, and Manchester; Clement Clapton Chesterman, Bristol: Henry Joseph Constantine Churchill, St. Bartholomew's; Stella Churchill, Royal Free; Antonio Mario Clément, St. Thomas's; Geoffrey Francis Cobb, St. Bartholomew's; Joseph Clinton Collins, London; Rupert Shelton Corbett, Cambridge and St. Bartholomew's; Ralph Coyte, St. Bartholomew's; William Cramer, Edinburgh and University College; Thomas Morley Cunnington, University College; Peter Gerald Stevenson Davis, St. Thomas's; Howard Lexster Douglas, London; Frances Jane Du Pré, Manchester and Charing Cross; John Rosslyn Earp, Cambridge and University College; Mahmoud Erfan, Cairo and St. Bartholomew's;

James Fairbrother, Cambridge and London; Robert French, Cambridge and St. Bartholomew's; Philip Edward Francis Frossard, London; Hugh Gainsborough, Cambridge and St. George's; Lawrence Gill, Guy's; Henry Gluckman, London; Edward Francis Strathearn Gordon, Cambridge and St. Bartholomew's; Mendel Gourevitch, Paris and London; Grace Mary Gulston Griffith, University College, Cardiff, and Leeds; Leslie Briggs Hartley, Cambridge and St. Thomas's; Frederick John Harvey, Birmingham; Lily Fanny Harwood, Royal Free; Sydney Limbrey Higgs, Cambridge and St. Bartholomew's; Harold Whewell Hogarth Holmes, Cambridge and St. Thomas's; Cawas Homi, Bombay and Middlesex; Joseph Christopher Campbell Howe and George Raymond Hubbard, Guy's; Oscar Hyam Hyman, St. Thomas's; Karam Chand Jaiska, Leeds and Bristol; Loiza Elwell Johnston, American Medical Missionary College; David Bruce Stewart Jones, Charing Cross; David Joseph Heritage Jones, St. Mary's; John Isaie Keen, Charing Cross; James Douglas Kenyon, Manchester; Hugh William Leatham, Cambridge and St. Thomas's; Harold Warburton Lewis, Middlesex; John Biddulph Strafford Lewis, Cambridge and St. George's; Isaac Jacob Lipkin, Liverpool; Evan Edwards Llewellyn, Cambridge and St. Bartholomew's; Leslie Grantham Lunnon, Middlesex; Thomas Hawks McLeod, St. George's; Arthur Neil McMillan, Middlesex; William Marriott, St. Thomas's; John Aston Martin, Cambridge and Guy's; Harold George Victor Mence, Birmingham; Frederick Maurice Mosely, Cambridge and London; Christopher Kilvinton Mowll, London; William Watson Newton, Birmingham; Arthur Leslie Packham, Middlesex; Alexander Edward Patrick Parker, Westminster; Andrew Harman Pearce, Cambridge and St. Thomas's; Cyril Valentine Pink, St. Thomas's; William Irving Fitzgerald Powell, London; Henry Norman Pritchett, Guy's; Walter Murad Abdul Rahman, University College; Ronald Eric Rampling, St. Thomas's; David William Ryder Richardson, Cambridge and London; Ralph Leslie Robinson and Arthur Rose-Innes, University College; John Rowland, St. Thomas's; John Douglas Rutherford, Cambridge and St. Bartholomew's; James Jules Avit Scott, Birmingham; Norman Fairbanks Smith, Oxford and St. Bartholomew's; Eric Dickens Spackman, Cambridge and St. Bartholomew's; Meredith Blake Robson Swan, Cambridge and King's College; Ellen Sylk, Royal Free; Ronald Henry Tasker, Bristol; John Percy Reginald Tennekoon, Ceylon Medical College and London; Lewis Henry Douglas Thornton, Cambridge and Middlesex; Frederick FitzGerald Tisdall, Toronto; William James Walters, Cambridge and Guy's; Francis Eaton Gordon Watson, St. Bartholomew's; Winifred Hannah Wells, Sheffield; William Harold White, St. Thomas's; John Prichard Williams, University College Cardiff and Westminster; James Harry Wiseman, Sheffield and London; Leonard Heatley Woods, St. Bartholomew's; and William Grant Woolrich, Cambridge and St. Thomas's.

The Licence in Dental Surgery was also conferred upon Mr. Percy King, Guy's Hospital, who has passed the requisite examinations and complied with the by-laws.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.

—As the result of the Final Examination, held from April 10th to 27th, the following candidates were approved in the undermentioned subjects, but have not yet completed the examination:—

Medicine.—A. L. Abel, University College; K. A. Anklesaria, Bombay and London; H. C. Apperly, Middlesex; E. B. Ash, Birmingham; Ruth Balfour, Royal Free; N. A. H. Barlow, Guy's; G. Bourne, St. Bartholomew's; F. Cameron, Charing Cross; H. Carpenter, University College; O. C. Carter, London; Annie Clark, Sheffield; Ruth Eden Conway, Manchester; A. J. Copeland, Glasgow and St. Bartholomew's; H. Das, University College; W. L. de Silva, Liverpool; Phyllis Decima Dixon, Royal Free; H. B. Dodwell, Cambridge and University College; Constance Maude Edwards, Liverpool; M. Edwards, St. Thomas's; W. Eldridge, London; S. Ghosh, Royal Free; Alice Mary Ley Greaves, Royal Free; E. G. Harris, London; A. H. Hilmy, St. Thomas's; C. V. Isard, St. Thomas's; N. R. Jenkins, Westminster; D. J. A. Lewis, London; A. G. F. McArthur, Cambridge and St. Thomas's; Ruby Eva McBirnie, Liverpool; J. G. McCann, St. Thomas's; D. G. Macpherson, University College; Ethel Mary Mathews, Sheffield; P. N. Menon, University College; R. S. Millar and H. Millett, Guy's; E. W. Mottau, University College; Annie Shortridge Mules, Royal Free; F. C. Odling, Cambridge and St. Thomas's; S. W. Page, St. Bartholomew's; A. V. Pegge, Cambridge and St. Bartholomew's; W. E. Powell, Charing Cross; S. H. de G. Pritchard, London; H. Ratnarajah, St. Mary's; F. N. Reynolds, St. Thomas's; S. Riddlough, Cambridge; Sophie Sarah Rosenberg, Royal Free; Helen Roth, Birmingham; H. Rowan, University College; J. F. Ryan, St. Thomas's; S. Sacks, London; Eleanor May Scarborough, Royal Free; K. L. Singer, Middlesex; B. L. Skeggs and P. A. Smuts, St. Bartholomew's; R. C. W. Staley, Guy's; C. M. Titterton, St. Bartholomew's; A. R. Tothill, Charing Cross; D. J. Valentine, London; J. A. van Heerden, St. Bartholomew's; J. Victory, Guy's; C. H. Warner and R. E. S. Webb, Middlesex; A. S. Westmorland, St. Mary's; A. Winfield, Cambridge and Liverpool; and E. B. Woolf, London.

Surgery.—E. Ahmed, London; R. D. Aylward, London; F. E. Benfix, Middlesex; J. A. Birrell, Cardiff and St. George's; A. G. Brett, Liverpool; W. B. Buer, Guy's; F. W. Chamberlain, Middlesex; Florence Marjory Edwards, Royal Free; J. S. Eloff, Cambridge and St. Thomas's; Eryl Glynne, Royal Free; J. Hale, Cambridge and St. Thomas's; Bertha Hinde, Royal Free; E. C. Hinde, Guy's; J. M. Hughes, Middlesex; Emily Catherine Lewis and Marguerite Frances Jane Lowenfeld, Royal Free; K. McFadyean, University College; H. M. Menage, St. Bartholomew's; A. K. Menon, Madras and London; P. D. J. Milanius, Ceylon and Middlesex; H. Morris-Jones, Liverpool; J. W. M. Nicholl, Cambridge and Middlesex; H. Palmer, London; E. R. Peirce, Birmingham; A. R. Poduval, Madras and St. Bartholomew's; H. J. R. Surrage, Cambridge and King's College; C. M. Titterton, St. Bartholomew's; G. H. Ward, Cambridge and St. Thomas's; and G. Zachariah, Madras.

Midwifery.—C. W. W. Armstrong, Guy's; E. B. Ash, Birmingham; K. E. Attenborough, St. Mary's; R. D. Aylward, London; R. W. C. Ball, Middlesex; E. R. Batho, St. Bartholomew's; G. E. Birkett, Cambridge and Manchester; J. W. Brash, St. Mary's; E. H. Bryant and A. Bulleid, Guy's; F. Cameron, Charing Cross; Annie Clark, Sheffield; W. E. L. G. Clark, St. Thomas's; B. S. Collings, University College; O. F. Conoley London; C. G. S. Corner, University College; Dorothy Trevor Dalntree, Royal Free; E. S. Davies, Westminster; W. L. de Silva, Liverpool; Phyllis Decima Dixon, Royal Free; C. L. Donne, Middlesex; F. B. Dutton, St. Thomas's; Constance Maude Edwards, Liverpool; Florence Marjory Edwards, Royal Free; M. Edwards, St. Thomas's; S. el D. A. El Daab, Cairo and St. Bartholomew's; J. S. Eloff, Cambridge and St. Thomas's; J. C. Gle, Guy's; E. H. Glenny and L. C. Goument, St. Bartholomew's; Lilian Maud Griffiths, Royal Free; A. G. Hewer, Middlesex; Bertha Hinde, Royal Free; E. A. Holmes, King's College; P. G. Horsburgh, St. Bartholomew's; J. F. Howells, University College; H. B. Jackson, Cambridge and St. Bartholomew's; M. Jackson, St. Barthomew's; G. H. Johnson, Middlesex; W. A. Jolliffe, St. Bartholomew's; A. K. I. Jones and J. W. Jones, Middlesex; H. C. C. Joyce, St. Bartholomew's; N. Kamchorn and C. H. Laver, Guy's; Ruby Eva McBirnie, Liverpool; K. McFadyean, University College; H. I. Marriner, St. Thomas's; H. Millett, Guy's; D. C. Mintzman, King's College; F. Morcos, St. Mary's; H. Morris-Jones, Liverpool; G. E. Mullins, Birmingham; J. G. Nel, Charing Cross; W. P. Nelson, Birmingham; G. Noott, Guy's; F. C. Odling, Cambridge and St. Thomas's; M. J. Panthaky, King's College; C. S. Parker, Charing Cross; Irene Grace Parsons, Royal Free; J. C. Pauw, London; R. W. Payne, Charing Cross; C. F. Rainer, London; C. G. J. Rayner, St. Bartholomew's; Joyce Baron Reed, Royal Free; Helen Roth, Birmingham; H. B. Russell and K. Sahib, St. Thomas's; M. Sarkies, Middlesex; J. J. Savage, St. Bartholomew's; H. M. Savery and W. M. Savery, Middlesex; Charlotte Annie Shields, Royal Free; A. T. Spoor, Cambridge and St. Thomas's; F. H. Stuttaford, St. Mary's; P. W. Symons, Middlesex; N. B. Thomas, St. Bartholomew's; J. A. van Heerden, St. Bartholomew's; G. Verghese, St. Andrews University; J. Victory, Guy's; P. E. Williams, St. George's; A. Winfield, Cambridge and Liverpool; and S. T. Wong, Guy's.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

—An extraordinary Comitia was held on May 10th, Dr. Frederick Taylor, the President, being in the chair. The following, elected to the Fellowship at the last meeting, were admitted to the College: Dr. R. H. Cole, Dr. D. N. Nabarro, Dr. H. W. Gardner, Dr. R. H. Miller, Dr. P. W. Saunders, Dr. W. E. Hume, Dr. H. MacCormac.—Licences to practise physic were granted to two candidates who had passed the required examination, their names not being included in the list submitted to the last meeting of the College.—A report from the Censors' Board concerning the will of the late Samuel Mathias Carl, advising the College to decline the bequest offered, was received and adopted after some discussion.—The Streatfield Research Fund Committee presented a report embodying a scheme for the administration of the Trust, which was adopted.—The Committee of Management having considered the proposal referred from the last Comitia concerning the suspension of the Regulations that students should attend systematic courses of lectures, reported as follows:—

> The Committee of Management beg to recommend to the Royal Colleges that, in consideration of the urgent conditions resulting from the war, Paragraph XIV., Clause 2 (*a*) and (*b*), and Paragraph XXI., Clause 1 (*a*) ,to (*g*), Section II. of the Regulations of the Examining Board in England, which require attendance on systematic courses of lectures, be not enforced for the present.[1]

This was agreed to.—A further grant of money was voted towards the expenses of the Committee of Reference.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

—An ordinary meeting of the Council was held on May 10th, Sir William Watson Cheyne, the President, being in the chair.—Mr. Ernest W. Hey Groves was introduced and the President handed to him a cheque for £15, the Jacksonian prize for the year 1916, together with a document declaratory of the award.—It was resolved to grant diplomas of Membership to 103 successful candidates.—In accordance with a report from the Committee of Management it was resolved:—

> That in consequence of (1) the depletion of the staffs of the hospitals and medical schools, (2) the reduction in the number of students, and (3) the amount of time necessarily devoted by students in their fourth and fifth years to practical clinical work owing to the shortage of resident medical officers, the regulations requiring attendance on systematic courses of lectures be not enforced for the present.[1]

The President reported that he had appointed Mr. William F. Haslam the representative of the College on the Medical Board of the University of Wales for three years.

At the Primary Fellowship Examination held on May 2nd, 3rd, and 8th, 30 candidates presented themselves, of whom 12 were approved and 18 were referred. The following are the names and medical schools of the successful candidates:—

Alberto Henrique Ferreira Bizarro, Lisbon University and University College; Reginald Stafford Foss, St. Thomas's; Lionel George

[1] The courses of lectures referred to are those on Anatomy, Physiology, Medicine, Surgery, Midwifery, Pathology, Pharmacology and Therapeutics, Forensic Medicine including Insanity, and Public Health.

Higgins, Cambridge and St. Thomas's; Thomas Ernest Victor Hurley, Melbourne; Roy Russell Kerr, Edinburgh and King's College; Vasant Ramji Khanolkar, University College; Fede Margaret Mackenzie, Royal Free; Kenneth Holl McMillan, St. Thomas's; Charles Dundas Maitland, St Thomas's; Maurice Marcus, London; Neil Frederick Sinclair, London; and Man Wong, St. Thomas's.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on May 15th the following gentlemen, having passed the requisite examinations, were admitted Fellows: Marsham A'Beckett M'Carthy, Herbert Evelyn Allenson, John Henry Cobb, George William Gower, Edward Ratcliffe Holborow, Hugh John M'Caw, and Frederick Agar St. John.—The Bathgate Memorial Prize, consisting of bronze medal and books, was, after a competitive examination in materia medica, awarded to Mr. Len Philip Samarasinha.

At the examinations, just concluded, for the Diploma in Public Health (Triple Qualification) the following candidates were successful:—

First Examination.—Ella Ferrier Pringle, Tha Doe, Gladys Ward, Leopold Mandel, John Lewis Owen, Gladys Richarda May Violet Williamson, and Michael Wilson Symington.

Second Examination.—Gladys Ward and Ella Elphinston.

MEDICAL SOCIETY OF LONDON.—At the annual general meeting, held on May 14th, the following Fellows were elected to office:—President: Sir StClair Thomson. Vice-Presidents: Sir Anderson Critchett, Dr. A. E. Garrod, C.M.G., F.R.S., Dr. J. H. Stowers, and Mr. H. J. Waring. Treasurer: Dr. J. Mitchell Bruce. Librarian: Dr. A. F. Voelcker. Honorary Secretaries: Mr. Hugh Lett and Dr. Edmund Cautley. Honorary Secretary for Foreign Correspondence: Dr. H. R. Spencer. Council: Mr. D. Armour, Sir Robert Armstrong-Jones, Dr. F. F. H. Bateman, Sir John Broadbent, Mr. L. V. Cargill, Mr. H. W. Carson, Dr. E. A. Cockayne, Mr. Edred M. Corner, Dr. J. Fawcett, Dr. W. J. Fenton, Dr. B. E. Goff, Mr. Owen Lankester, Mr. J. D. Malcolm, Dr. F. W. Mott, F.R.S., Mr. C. J. Ogle, Mr. G. C. Parnell, Mr. D'Arcy Power, Dr. D. Lloyd Roberts, Mr. C. Ryall, and Mr. R. Jocelyn Swan.

INSANITY IN IRELAND.—An Irish correspondent writes: The report for 1915 of the Inspectors of Lunatics in Ireland, recently issued, is remarkable in that for the first time since 1865 there has been no increase in the number of insane under care in Ireland. There has, in fact, been a decrease of 77, the total number on Jan. 1st, 1916, being 25,103. Moreover, the decrease is to some extent due to a lessened admission rate, the decrease, however, being entirely among males. There was an actual increase among females. Although this is the first actual decrease recorded for many years, the rate of increase had for the past five years been considerably retarded. Thus the average annual increase from 1904 to 1914 was 218, but from 1909 to 1914 it was only 104. In proportion to the total population there were, in 1915, 573 insane per 100,000. It is noted that in 1·32 per cent. of the total admissions to asylums during the year the war was assigned either as the principal or a contributory cause of the insanity. Moreover, this cause appeared to affect women more than men.[1] During the year there were in the district asylums two deaths from suicide, two from misadventure, and three from injuries inflicted by fellow-patients. From the notes of the inspectors on the several asylums visited it is clear that in many of them there is much room for improvement.

DONATIONS AND BEQUESTS.—The King has sent a donation of £200 to King Edward VII. Hospital, Windsor, towards the extinction of a debt of £1925, and a lady has offered to give £1000 provided the balance of the debt is subscribed before the end of May.—By will the late Miss Sarah Jane Waddell, of Bridgwater, Somerset, bequeathed £500 each to the Bridgwater Nursing Association, the Bridgwater Hospital, the Devonshire Hospital, Buxton, and £100 each to the Queen's Hospital, Birmingham, Dr. Barnardo's Homes, and the Charity Organisation Society.—The late Mr. Samuel Bayley Verney Asser, of Westwood-place, Windlesham, Surrey, has left £500 for such hospitals in the City and County of London as the executors may select.—Miss Anna Pigeon, of South Side, Clapham Common, has left £300 each to the Clapham Dispensary and the Royal Surgical Aid Society.—The late Mrs. Harriet Stock Bradley, of Leamington Spa, has bequeathed £1000 to the Midland Home for Incurables, Leamington, and part of the residue of her estate to the Walsall and District Hospital and the Leamington and Warneford Hospital.—The late Mr. William Walmsley Simpson, of Winkley, Whalley, Blackburn, has left by will £1000 to the Blackburn Infirmary and £350 to the Oswaldtwistle Nursing Association.—After certain small bequests, the residue of the estate of the late Mrs. R. M. Acock, of Croydon, valued at £10,000, has been left to Guy's Hospital, Croydon General Hospital, the Cancer Hospital, Fulham, and the Hospital for Consumption, Brompton.—The late Mr. Charles E. Godfrey, of Southsea, has left by will 1000 shares in Chas. Godfrey & Co. in trust for the Royal Portsmouth Hospital.—Mr. R. F. Bolitho has given £1500 to the West Cornwall Infirmary, Penzance, to endow a bed to the memory of his late sister, Miss Sage Ley Bolitho.—The late Mr. T. R. Butcher, of Bath, has bequeathed £8000 to the British Red Cross Society.—By the will of the late Mr. Charles James Atkinson, of Bath, the British Home for Incurables, Streatham, will receive £1000, and the Royal United Hospital, Bath, and the Mineral Water Hospital, Bath, £500 each.

THE LATE DR. T. E. UNDERHILL.—We regret to record the death of Thomas Edgar Underhill, M.D., C.M. Edin., F.R.C.S. Edin., aged 62. He had practised for the last 27 years at Barnt Green in Worcestershire, having previously for four years practised at Bromsgrove, where he had succeeded the late Dr. Prosser. Dr. Underhill belonged to a well-known medical family, his father and uncle having been among the best-known practitioners in South Staffordshire, where their work and name are still continued. After taking his degree at Edinburgh in 1876, he joined his father in practice at Tipton, Staffordshire, where he remained for 10 years, holding at that time the post of surgeon to the Guest Hospital at Dudley. On moving to Bromsgrove he became medical officer to the school and surgeon to the local Volunteer Battalion of the Worcestershire Regiment, retiring with the rank of surgeon-major after 16 years' service. He also took an active part in local affairs, being vice-chairman of the School Board and bailiff of the Bromsgrove Court Leet. The activities of a large practice did not prevent him taking part in other public work. He was President of the Midland Medical Society, and latterly worked in connexion with the British Red Cross, being medical officer to the "Beaconwood" Convalescent Hospital for Wounded Soldiers. Dr. Underhill leaves a widow. Five of his sons are serving in H.M.'s Forces. He will be greatly missed by a wide circle of friends and patients.

[1] See also THE LANCET, May 5th, p. 694.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Secret Session.

AT the conclusion of questions on Thursday, May 10th, and Friday, May 11th, the House of Commons sat in secret session.

Venereal Disease Bill.

The Venereal Disease Bill has passed through report in the House of Commons and been read a third time. In the course of a short debate on the motion for the third reading, which took place on Tuesday, May 15th, Mr. HAYES FISHER (Parliamentary Secretary to the Local Government Board) repeated his statement that there was no evidence that venereal disease was on the increase in this country, but the report of the Royal Commission had thrown a very powerful searchlight on the problem, and had shown the necessity for dealing with the matter by legislation. He hoped the Bill would do something towards providing a remedy for the disease, and would gradually diminish the number of those suffering from it. Some other speeches presented views which had previously been expressed in the proceedings on second reading and in Committee. Sir WILLIAM COLLINS expressed the hope that the Bill would accomplish something useful, but he criticised some of the provisions. The third reading was agreed to without a division.

HOUSE OF COMMONS.

WEDNESDAY, MAY 9TH.

The Rum Ration.

Answering Mr. L. HASLAM, Mr. MACPHERSON (Under Secretary for War) said: Rum is issued at the front at the discretion of the General Officer Commanding on the recommendation of the medical officer, and it is not proposed to interfere with this discretion. The method of distribution must obviously depend on the circumstances of each particular occasion.

THURSDAY, MAY 10TH.

Medical Re-examinations.

Mr. MONTAGUE BARLOW asked the Under Secretary for War with regard to the Military Service (Review of Exceptions) Act whether he would give instructions that in every case where a discharged man was required to present himself for examination under the Act his papers, and in particular his full medical history, should be before the board who held the examination.—Mr. MACPHERSON wrote in reply: This is already provided for by the existing recruiting regu-

lations, and steps are being taken to remind recruiting officers of their responsibility in ensuring that this regulation is strictly adhered to.

Body Shields for Soldiers.

Mr. MACPHERSON informed Mr. SNOWDEN that the question of the provision of body shields for soldiers had been considered, but no decision had been reached.

Spotted Fever at Chisledon Camp.

Mr. SNOWDEN asked the Under Secretary for War whether there was an outbreak of spotted fever at Chisledon Camp, Swindon, and whether any deaths had taken place from this cause.—Mr. MACPHERSON replied: I am informed that since April 1st last 12 cases have occurred in this camp, and of these three have died.

MONDAY, MAY 14TH.

Prevention of Contagion from Venereal Disease.

Sir ERNEST LAMB asked the Under Secretary for War whether any steps were being taken to prevent venereal disease being communicated to men sleeping in blankets that had previously been used by persons suffering from such complaint.—Mr. MACPHERSON replied: Yes, sir. Under the regulations blankets which may have been exposed to infection are soaked in cresol solution before being washed. I have no reason to suppose that this precaution is being neglected.

Medical Attendance on Soldiers' Widows.

Major CHAPPLE asked the Pensions Minister what provision was to be made for the medical treatment of widows and orphans of sailors and soldiers during and after the war.—Mr. BARNES answered: The National Health Insurance Commissioners are now considering at my request how the medical treatment of widows and orphans of sailors and soldiers killed in the present war can be best provided. My honourable friend is doubtless aware that the whole question of medical service will be further dealt with in connexion with the proposal to establish a Ministry of Health.

Supply of Artificial Limbs.

Answering Major CHAPPLE, Mr. BARNES said: The total number of artificial limbs supplied from the beginning of the war up to the end of last month was 8805. The total public expenditure during this period on the supply and renewal of artificial limbs and other surgical appliances was £127,293.

TUESDAY, MAY 15TH.

Medical Men in Combatant Units.

Answering Mr. WATT, Mr. MACPHERSON said: Steps have been taken to withdraw medical practitioners who are officers of the fighting forces. All medical practitioners who are known to be non-commissioned officers and men are invariably offered appointments as officers in the Royal Army Medical Corps if fitted to hold His Majesty's commissions.

WEDNESDAY, MAY 16TH.

Volunteer Field Ambulances.

Sir W. COLLINS asked the Under Secretary for War whether the proposals for the formation of volunteer field ambulances which were under consideration with a view to an early settlement on April 3rd had now been completed; and what were the arrangements which had been made for an ambulance service or for regimental medical officers in connexion with the Volunteers.—Mr. MACPHERSON wrote in reply: The formation of field ambulances for Home Service on a Volunteer basis has been approved and offers of service have been invited from certain counties. If the result proves satisfactory the scheme will, I hope, be extended. The appointment of medical officers is proceeding, but it is not free from difficulty owing to the demand for medical officers for service overseas and for full-time service in this country, which has necessitated the imposing of certain restrictions as to age upon candidates for Volunteer appointments.

BOOKS, ETC., RECEIVED.

ARNOLD, EDWARD, London.
Introduction to Special School Work. By Marion F. Bridle, L.L.A. With Foreword by G. A. Auden, M.A., M.D., M.R.C.P. 3s. 6d. net.

BADGER, RICHARD G., Boston and Toronto.
The History and Practice of Psychanalysis. By Paul Bjerre, M.D. Translated by Elizabeth N. Barrow. $3 net.

BLACKWOOD, WILLIAM, AND SONS, London and Edinburgh.
The Tale of a Casualty Clearing Station. By a Royal Field Leech. 5s. net.

CRITERION PRESS, Leicester and London.
Cycling for Health and Points for Cyclists. By Frank Bowden, F.R.G.S. 1s. net.

DORAN, W., Philadelphia.
Transactions of the Southern Surgical and Gynecological Association. Vol. XXVIII. Edited by W. D. Haggard, M.D. Medical and Surgical Reports of the Episcopal Hospital Church in Philadelphia. Vol. III.

FROWDE, HENRY, AND HODDER AND STOUGHTON, London.
Treatment of Joint and Muscle Injuries. By W. Rowley Bristow, M.B., B.S. Lond., F.R.C.S., Captain, R.A.M.C. (T.). 6s. net.

HEINEMANN, W., London.
War Shock: the Psycho-Neuroses in War, Psychology and Treatment. By M. D. Eder, late temporary Captain, R.A.M.C., and M.O. in Charge of Psycho-Neurological Department, Malta. 5s. net.
Malingering. By A. Bassett Jones, late temporary Honorary Lieutenant, R.A.M.C., and Ll. J. Llewellyn, M.B. Lond., attached to 2nd Southern General Hospital. With a chapter on Malingering in Relation to the Eye, by W. M. Beaumont, Acting Ophthalmic Surgeon to the Bath War Hospital. 25s. net.

HODDER AND STOUGHTON, London.
In Mesopotamia. By Martin Swayne. 5s. net.

LAURIE, T. WERNER, LTD., London.
Reflections on Victory and a Project for the Federation of Governments. By Arthur Capel. 2s. net.
The Cameroons. By A. F. Calvert, F.C.S. 6s. net.

LEWIS, H. K., London.
Causation of Sex. By E. Rumley Dawson, L.R.C.P. Lond., M.R.C.S. Eng. Second edition. 7s. 6d. net.

LONGMANS, GREEN, AND CO., London.
Common Diseases of the Male Urethra: Being a Course of Lectures Delivered at the London Hospital. By Frank Kidd, M.B., B.C. Cantab., F.R.C.S. Eng. With Additions on Clinical Pathology of Urethritis. By Dr. Philip Panton. 5s. net.
Secretion of the Urine. By Arthur Cushny, M.A., M.D., LL.D., F.R.S. 9s. net.

MACMILLAN AND CO., London.
The New System of Gynæcology. Edited by Thomas Watts Eden, M.D., F.R.C.S.E., F.R.C.P., Temporary Major, R.A.M.C., and Cuthbert Lockyer, M.D., B.S., F.R.C.S., F.R.C.P. Three vols. £6 6s.

MURRAY, JOHN, London.
A Regimental Surgeon in War and Prison. By Captain R. V. Dolbey, M.B., M.S. Lond., F.R.C.S., R.A.M.C. 5s. net.

PRINCETOWN UNIVERSITY PRESS; HUMPHREY MILFORD, London, and OXFORD UNIVERSITY PRESS.
Physical Chemistry of Vital Phenomena for Students and Investigators in Biological and Medical Sciences. By J. F. McClendon. $2.

STANDARD ART BOOK CO., LTD., 30-32, Ludgate-hill, London.
The Roll of Honour: a Biographical Record of all Members of His Majesty's Naval and Military Forces who have Fallen in the War. By the Marquis de Ruvigny. Vol. I.

THACKER, W., AND CO., London.
Studies in Malaria. By Hugh Stott, M.B., B.S. Lond., Captain, I.M.S. 10s. 6d. net.

UNIVERSITY PRESS, Chicago.
A Chemical Sign of Life. By Shiro Tashiro, Instructor in Physiological Chemistry, University of Chicago. $1 net.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

ARNOTT, J., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Brampton District of the county of Cumberland.

WYNN, W. H., M.D. Lond., Honorary Physician to the Birmingham General Hospital.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

APPLECROSS, Ross-shire.—Medical Officer and Public Vaccinator. Salary £320 per annum.

BOOTLE BOROUGH HOSPITAL.—Junior House Surgeon. Salary £170 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURNLEY, VICTORIA HOSPITAL.—House Surgeon. Salary £160 per annum, with board, &c.

BURY ST. EDMUNDS, SUFFOLK HOSPITAL, Ampton Hall.—Resident Medical Officer. Salary £400 per annum, with board, &c.

CAPE TOWN, SOUTH AFRICAN COLLEGE.—Professors of Pharmacology, Pathology, and Bacteriology. Salary at rate of £800 per annum each.

CARDIFF, KING EDWARD VII.'s HOSPITAL.—House Surgeon for six months. Salary at rate of £175 per annum, with board, &c.

CHARING CROSS HOSPITAL, W.C.—Honorary Anæsthetist.

DERBYSHIRE COUNTY COUNCIL.—Temporary Medical Superintendent for County Sanatorium and Tuberculosis Officer. Salary £500 per annum.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

EVELINA HOSPITAL FOR CHILDREN, Southwark, S.E.—House Physician for four months. Salary at rate of £160 per annum, with board, &c.

EXETER WAR HOSPITAL.—Resident Medical Officer. Salary £1 per diem, with board, &c.

FRIMLEY COTTAGE HOSPITAL, Surrey.—Assistance to help Medical Staff.

GLOUCESTERSHIRE ROYAL INFIRMARY AND EYE INSTITUTION.—Senior House Surgeon. Salary £150 per annum, with board, &c.
HOLLAND (LINCOLNSHIRE) COUNTY COUNCIL.—Temporary County Medical Officer of Health and Temporary School Medical Officer. Salary £450 per annum.
HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.
LABORATORIES OF PATHOLOGY AND PUBLIC HEALTH, 38, New Cavendish-street, W.—Bacteriologist.
LEEDS CITY, PUBLIC HEALTH DEPARTMENT.—Female Medical Assistant for Infant Welfare Work, to assist occasionally at Tuberculosis Dispensary. Salary £350 per annum.
LEEDS PUBLIC DISPENSARY.—Resident Medical Officer. Salary £200 per annum, with board, &c.
MANCHESTER, ANCOATS HOSPITAL.—House Physician. Salary £200 per annum, with board, &c.
MANCHESTER, BAGULEY SANATORIUM FOR TUBERCULOSIS.—First Assistant Medical Officer, unmarried. Salary £400 per annum, with board, &c.
MANCHESTER CHILDREN'S HOSPITAL, Gartside-street.—Assistant Medical Officer for the Out-patient Department. Salary £150 per annum.
MANCHESTER ROYAL EYE HOSPITAL.—House Surgeon. Salary £120 per annum, with board, &c.
NOTTINGHAM CHILDREN'S HOSPITAL.—Female House Surgeon. Salary at rate of £200 per annum, with board, &c.
QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.—Casualty Officer.
ST. BARTHOLOMEW'S HOSPITAL.—Resident Junior Medical Officer for the Special Department for the Diagnosis and Treatment of Venereal Diseases, for three months.
ST. GEORGE'S-IN-THE-EAST TUBERCULOSIS DISPENSARY, London, E.—Temporary Medical Officer. Salary at rate of £500 per annum
ST. HELENS COUNTY BOROUGH.—Temporary Assistant Medical Officer of Health. Salary £350 per annum.
ST. PANCRAS INFIRMARY, Dartmouth Park Hill, Highgate, N.—Senior and Junior Assistant Medical Superintendents.
ST. PETER'S HOSPITAL FOR STONE, &c., Henrietta-street, Covent Garden, W.C.—Senior and Junior House Surgeons for six months. Salaries at rate of £75 per annum, with board, &c.
SALFORD COUNTY BOROUGH.—Temporary Tuberculosis Officer. Salary £400 per annum.
SALISBURY GENERAL INFIRMARY.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.
SHEFFIELD ROYAL HOSPITAL.—Casualty Officer. Salary £130 per annum Assistant House Surgeon. Salary £120 per annum, with board, &c.
SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.
WIGAN, ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY.—Medical Officer to take charge of Out-patient Department. Salary £250 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Enniscorthy (Wexford) and at Redruth (Cornwall).

Births, Marriages, and Deaths.

BIRTHS.

CARMICHAEL.—On May 10th, at Atholl-crescent, Edinburgh, the wife of Lieutenant Norman Scott Carmichael, R.A.M.C., of a daughter.
COOK.—On May 12th, to Evelyn Russell and Joseph Basil Cook, M.D., D.P.H., R.A.M.C., of the Infirmary, Isleworth—a daughter.
FAIRLIE.—On May 12th, at Mecklenburgh square, W.C., the wife of William M. Fairlie, M.D., of a daughter.
MCDOUALL.—On May 8th, at Red Bank, Hornsey-lane, Highgate, N., the wife of J. C. S. McDouall, West African Medical Staff, of a daughter.
MAIDMENT.—On May 8th, at Harleston, Norfolk, the wife of Frederick N. H. Maidment, M.B., F.R.C.S. Edin., of a son.
POULTON.—On May 7th, at Wykeham Cottage, Woldingham, Surrey, to Elfrida, wife of E. P. Poulton, M.D., F.R.C.P.—a son.
SETH-SMITH.—On May 11th, at Tower House, Bildeston, Suffolk, the wife of Douglas Seth Smith, M.R.C.S., L.R.C.P.—a daughter.

MARRIAGES.

FRASER—CHARD.—On May 15th, at Chichester, by the Rev. J. B. Sherrin, assisted by the Prebendary Rickard, vicar of the parish, Major Alexander Edward Gordon Fraser, R.A.M.C., only son of the late Donald Alexander Fraser, M.D., of Totnes, Devon, to Dorothy Louise Josephine, elder daughter of the late R. A. S. Chard, of Magnolia, West Tarring, Worthing.
HOPKINS—MILES.—On May 12th, at St. Mary's, Prittlewell, Lionel Gordon Hopkins, M.D., to Dorothy Bessie Miles.
KEYNES—DARWIN.—On May 12th, at St. Bartolph's, Cambridge, Captain G. L. Keynes, M.A., R.A.M.C., to Margaret Elizabeth, younger daughter of the late Professor Sir George Darwin, K.C.B.

DEATHS.

FAIRWEATHER.—On April 29th, at Forest Hill, Beaumont, Jersey, Surgeon-General James Fairweather, M.D., F.R.C.S., Indian Medical Service (retired), aged 89.
FOWLER.—On May 3rd, at Essington House, Hereford, John Bucknill Fowler, M.R.C.S. Eng., and late of Kobe, Japan, aged 55.
RAE.—On April 15th, reported missing, believed drowned, James Rae, M.A., M.D., Lieutenant, R.A.M.C., who was on board the torpedoed troopship *Arcadian*.
RYLEY.—On May 4th, Charles Ryley, Major, R.A.M.C.
UNDERHILL.—On May 8th, at Dunedin Barntgreen, Worcestershire, T. Edgar Underhill, M.D., F.R.C.S. Edin., F.R.S. Edin., aged 62.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

TOBACCO.

To the Editor of THE LANCET.

SIR,—As there is at the present time much interest in the subject of tobacco, in consequence of increased taxation, the following statistics of its production may be useful to your readers. In the United States, in 1901, the acreage under tobacco was 1,039,199, the number of pounds produced 818,953,373, and the value in dollars 58,283,108. Ten years later the following were the figures: 1,013,000 acres, 905,109,000 lb., $85,210,000. The Americans estimate that the total production by tobacco-growing countries is roughly 2053 million pounds, of which it is claimed practically 1100 million pounds are produced by the United States and the remainder as follows: Cuba, 45 millions; Mexico, 35 millions; Santo Domingo, 33 millions; Argentina, 31 millions; Brazil, 75 millions; Hungary, 160 millions; France, 37 millions; Germany, 64 millions; Russia, 201 millions; Turkey, 50 millions, but including Asiatic Turkey 100 millions; Java, 84 millions; Sumatra, 45 millions; and Japan, 92 millions.

An English estimate is that the total production amounts to 2,756,000,000 lb., produced chiefly by the following countries: United States, 1,113,400,000 lb.; India, 450,000,000 lb.; Russia, 200,000,000 lb.; Austria-Hungary, 184,000 000 lb.; Netherlands' East Indies, 128,600,000 lb.; Japan, 93,000,000 lb. The value of the tobacco imported by the United Kingdom is placed at about £6,350,000, before the war, but the value of the tobacco exported was £2,600,000. The import for 1915 is placed at £8,550,000, and the export at £3,790,000. The consumption of tobacco in France, according to French figures, is 39,500,000 kilogrammes (about 86,900,000 lb.) In 1911 the Union of South Africa produced 14,961,199 lb. In Canada in 1910 the production was 17,604,917 lb. from 19,194 acres. In Ireland from 1887 to 1904 experiments were carried on in County Meath and in 1900 and 1901 in several other counties. In 1904 20 acres were planted. The results proved satisfactory, and tobacco is now grown in Meath, Louth, Wexford, King's County, Kilkenny, and Cork, about 150 acres altogether. In England a small quantity was grown a few years ago in south-west Norfolk. Sixty years ago 20 per cent. would have had to be added to the weights given for adulteration, such as dock, rhubarb, coltsfoot, chicory, endive, oak, elm, and even maize and sunflower leaves. These are bare facts, and I do not propose to draw any deductions from them, but they undoubtedly have a medical bearing as well as a commercial interest.

I am, Sir, yours faithfully,

May 8th, 1917. PETUN.

HERB-GROWING IN THE WEST OF ENGLAND.

A LARGELY attended public meeting was recently held at Totnes (Devon) in connexion with the National Herb-Growing Association. The organiser for Devon (Mr. C. Walkey) reported that the society was founded in 1915, and had now over 2000 members. Collections of herbs had been arranged over an area of 250,000 acres in Somerset, including all Exmoor. Drying sheds were to be erected at Torquay and Taunton. The society would require large quantities of foxglove seeds and dandelions, as well as of belladonna roots. The association had received one order for £2000 worth of medicinal herbs, and it was estimated that the trade in these plants was worth not less than £200,000 a year.

NORTHERN TERRITORIES OF THE GOLD COAST.

ACCORDING to the report on the Northern Territories for 1915, recently received at the Colonial Office, the health of the European population, consisting almost exclusively of Government officials, was fairly good, and there was no death. The health of the native officials was also fairly good. The prevalent disease was malaria.

The Census completed in 1911 gave an estimated population of 361,806 to the Northern Territories, with a computed area of 31,100 square miles—an average of 11·6 persons to the square mile. In spite of the heavy infant mortality it is considered that the population at the present day is greatly in excess of that shown by the Census, as there is reason to believe that in the North-Eastern Province not more than two-thirds of the inhabitants were enumerated. No serious outbreak in epidemic disease occurred during the year. Anthrax was reported to have broken out at the village of Zongiri in the Bawku district, where eight natives died, but the medical officer who visited the village found that it had not spread, and that there were no further cases of infection. Leprosy is not on the increase, and, while uncommon in the Southern and North-Western Provinces, is of more frequent occurrence in the North-Eastern Provinces. The natives look upon it as "a visitation of Allah," but say that it shows no signs of spreading and are generally averse to compulsory isolation. The medical officer at Salaga states that the

death-rate in that district for the year was 33·25 per 1000. It is considered that much of the disease among the native population is caused by the poor water supply, to improve which efforts are now being made.

There are four Government hospitals in the Southern Province, three in the North Western Province, and four in the North-Eastern Province. The attendance of out-patients at these hospitals increases yearly, but the natives object to the restrictions placed on them as in-patients, and only those suffering from the worst complaints can be persuaded to remain in hospital for any length of time. 2226 out-patients and 115 in-patients were treated at the Tamale Hospital during the year, 972 and 14 at Saliga, 473 and 22 at Bole, 217 and 8 at Lorha, 589 and 22 at Gambaga, and 319 and nil at Navarro respectively.

THE USE OF MAIZE IN BREAD.

To the Editor of THE LANCET.

SIR,—My experience among my patients is that the mixed flours agree well if the addition of barley or oatmeal is made, but if maize is mixed, within a few days consumers complain of colic, sometimes of a severe character. I have suggested to patients who have consulted me in these circumstances that they discontinue eating the particular flour they are consuming and purchase either wholemeal or a flour which they are certain only contains barley or oats as an addition—not maize. In every case where this has been done the pain has ceased. This result of eating flour and maize was to be expected, and is well known to anyone who has resided long in the East, where the adulteration of wheaten flour with maize is common. As it is necessary for every worker to keep himself or herself as fit as possible, would it not be advisable to have each sack branded with the particular kind of admixture, so that all purchasers could buy the one which agreed with them best?

I am, Sir, yours faithfully,

May 7th, 1917. ANGLO-INDIAN.

MEDALS FOR SERVICE IN THE ARMY AND NAVY.

LONG lists of honours call repeated attention to medals and decorations. A few years ago a guide to the Department of Coins and Medals in the British Museum was printed by order of the trustees, and was intended for those who while taking an intelligent interest in the subject were not inclined to devote much time or attention to any particular class of medals or coins. The following excerpt is interesting:—

> The exhibition of English medals is completed by a selection of military and naval decorations. The custom of presenting these decorations is of very recent date, and it may be said only to have been established during the reign of Queen Victoria. As already mentioned, it is supposed that some of the Armada medals were intended for decorations, as they still bear chains for suspension. During the Civil War it is also supposed that the numerous royalist and parliamentarian badges were intended to be worn by the followers of both sides; and we have distinct evidence that during the Commonwealth decorations were ordered both for the Navy and the Army. During the whole of the eighteenth century decorations were only occasionally granted, and then in most cases singly; and the famous victories of the Nile and Trafalgar received no official recognition. It is very doubtful whether the Culloden medal was ever granted, as there is no evidence of an order to that effect; and besides it is excessively rare, only a few specimens in gold, silver, and copper being known. During the Peninsular War some special decorations were issued to the officers of both services, but the East India Company acted in a much more liberal spirit and awarded medals to men of all ranks who were in its service for several of the more important campaigns. The first medal for general distribution issued by authority in this century was that given for the battle of Waterloo. It was conferred by order of the Prince Regent upon every officer, non-commissioned officer, and private present at that battle, but no general acknowledgment was made for all the brilliant engagements in the Peninsular War till 1847, when a medal was issued "for military services" between the years 1793-1814. At the same time a corresponding medal "for naval services" was ordered to be struck for all naval engagements. Since that date medals have been awarded for every campaign, as well as others for "distinguished service," for "meritorious service," for "long service," special acts of bravery, &c.

Three useful books may be mentioned which afford further information:—"War Medals and their History," by W. Augustus Stewart (London: Stanley Paul and Co. Price 12*s.* 6*d.*); "Naval and Military Medals," by Lieut.-Commander Taprell Dorling (London: Geo. Philip and Sons. Price 2*s.*); and "British and Foreign Orders, War Medals and Decorations," by A. A. Payne, L.R.C.P., M.R.C.S. (Published in 1911. Price 31*s.* 6*d.*). Gale and Polden's books published at Aldershot, on medals, buttons, and ribbons, are well known.

J. B. C.—Appointments to venereal treatment centres are made by the authorities of the hospitals to which the clinics are affiliated but it is probable that the arrangements will be modified after the first year of working or at the conclusion of the war, when some of these appointments, especially in the provinces, may be directly in the gift of the Local Government Board. All appointments are now part-time, but some may become whole-time ones, and if the Ministry of Health comes into being there will probably be regular organisation.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, May 21st.

ODONTOLOGY (Hon. Secretaries—F. R. Smyth, F. N. Doubleday, J. Howard Mummery): at 5.30 P.M., at the Royal College of Surgeons, Lincoln's Inn Fields.

Annual General Meeting.—Election of Officers and Council for 1917-1918.

Exhibition of Specimens, &c.:

Professor Arthur Keith, F.R.S., and Mr. J. F. Colyer will demonstrate specimens recently added to the Museum.

Tuesday, May 22nd.

MEDICINE (Hon. Secretaries—Charles R. Box, W. Cecil Bosanquet): at 5.30 P.M.

Annual General Meeting.—Election of Officers and Council for 1917-1918.

Thursday, May 24th.

BALNEOLOGY AND CLIMATOLOGY (Hon. Secretaries—Chas. W. Buckley, J. Campbell McClure): at 5.30 P.M.

Annual General Meeting.—Election of Officers and Council for 1917-1918.

Report of Council.

Friday, May 25th.

STUDY OF DISEASE IN CHILDREN (Hon. Secretaries—A. S. Blundell Bankart, E. A. Cockayne, C. P. Lapage): at 4.30 P.M.

Annual General Meeting.—Election of Officers and Council for 1917-1918.

Cases will be shown.

EPIDEMIOLOGY AND STATE MEDICINE (Hon. Secretaries—William Butler, Major Greenwood, jun.): at 8.30 P.M.

Annual General Meeting.—Election of Officers and Council for 1917-1918.

Paper:

Miss Muriel Robertson: Recent Researches into the Etiology of Typhus.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.

THURSDAY.—3 P.M., Prof. W. Bateson: The Chromosome Theory of Heredity and the Alternatives. (Lecture II.)

FRIDAY.—5.30 P.M., Mr. J. Barcroft: Breathlessness.

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY.—4 P.M., Lecture VI.:—Sir C. Arthur Pearson, Bart.: The Re-education and Training of Disabled Combatants. Followed by a discussion.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, May 16th, 1917.

Date.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Tem.	Wet Bulb.	Dry Bulb.	Remarks.
May 10	...	101	65	46	51	54	Cloudy
,, 11	...	120	77	52	58	65	Cloudy
,, 12	...	116	73	56	58	65	Cloudy
,, 13	...	117	81	56	57	63	Fine
,, 14	...	116	78	60	57	63	Cloudy
,, 15	...	105	68	57	56	60	Overcast
,, 16	...	81	54	47	46	49	Overcast

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

The following journals, magazines, &c. have been received:—Revista Clinica, Veterinary Review, Journal of State Medicine, Revue de Chirurgie, Medical Review, Midland Medical Journal, Revista de Medicina, Annaes Paulistas de Medicina e Cirurgia, Boletin de Cirurgia.

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Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

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Annual Oration
ON
THE CAMPAIGN AGAINST SYPHILIS.

Delivered before the Medical Society of London, May 14th, 1917,

BY SIR WILLIAM OSLER, BART., M.D., F.R.S.,
REGIUS PROFESSOR OF MEDICINE, OXFORD.

MR. PRESIDENT AND GENTLEMEN,—With the flotsam and jetsam of the sale-room there came to my library the other day a book for the times, with the title "A Discourse of Constancy ..... written in Latin by Justus Lipsius. Containing Comfortable Consolations, for all that are afflicted in Body, or Mind. London. 1654." To have known of the "Discourse" through two admirable articles by Basil Anderton, of Newcastle,[1] gave an added welcome to Humphrey Moseley's 12mo. "in the original state."

In the dialogue the two friends discuss the miseries of the age, which had made the Low Countries almost as desolate as they are to-day, and the great Louvain Professor a homeless wanderer. To the despairing Lipsius his friend urged that "equal calamities and far greater had already fallen on the race," and that after all it was the lot of man, his destiny, and that cities and people owe their ruin "by Commission of Providence." As a tonic to their constancy they rehearse through many chapters the wonderful slaughters, the strange cruelties, the plagues and famines and rapines; and the conclusion reached was that Good comes out of Evil, and that the righteous are never forsaken. Having accepted this comfortable consolation, hard for us to read anywhere except on the title-page of the book, our neo-Stoical friends went to dinner!

THE CONQUEST OF THE GREAT INFECTIONS.

The past three years have seen the slaughter of man by man on a scale heretofore unknown except in the lively imagination of the Chronicler of the Kings of Israel. On the illustrated title-page of the little book, Fate and Necessity beam from the sky dispelling the clouds and mist, and the light of Providence shines on the figure of Constantia. To us in these dark days comes a consolation denied to Lipsius and his friend. They did not realise as we do, that it is Apollo, not Mars, who slays most in war, that nature in the form of disease is more fatal to man than man with his weapons. The needless deaths of Peace far exceed those of the most disastrous wars. More people died of plague in two years in India than have been killed on both sides since the great war began. In 1915, while nine of our soldiers abroad died every hour to save their country 12 babies died at home in the same time, to the scandal of their country.

The knowledge of nature's laws has enabled men to devise really magnificent ways of wholesale butchery; yet with a delicious inconsistency the same knowledge has taught him the science of her ceaseless warfare through disease, and has enabled him to win the greatest victory in the history of humanity. Even in war time man displays just as much hostility to a hostile nature as he does to the enemy in the field. Bitter experience has shown him that disease is more fatal than powder and shot. The new knowledge has enabled him for the first time to reverse the ratio between bacilli and bullets. Full details are not to hand for the Allied Forces, but we know that the destructive pestilences have played a minor, not as heretofore the major, rôle. And it has been the same in the German armies in which the deaths from disease have been about 1 to 15 killed and died of wounds.

The story of the conquest of the great infections is the brightest single chapter in the history of science. The humanitarian aspect appeals to our better feelings, and hopes for the betterment of the race have been centred about health and homes and habits. There is a fly in the amber of course, and the vision is blurred (narrowed, indeed, to darkness!) as one looked in two directions—towards cancer and towards venereal disease. In choosing a subject for my address I could not let the opportunity slip of lending the weight of this ancient and honourable society to anything I might say upon the great awakening that has taken place with regard to syphilis and gonorrhœa. Among infections they stand alone. Against all others man wages a keen warfare. They present the remarkable and subtle combination of man and nature in an incessant and successful propaganda against the health of the nation. The report by Dr. R. W. Johnstone to the Local Government Board, 1913, and the report of the Royal Commission embrace every aspect of the question.

STATISTICAL DATA.

I propose to touch upon only two points—the importance of the enemy and the possibility of a successful campaign. I had the inestimable advantage of early professional association with a hero-worshipper. Dr. Palmer Howard, my teacher and for ten years at Montreal my revered colleague, was a man of keen intellectual attachment. Wide-awake when the dawn appeared, he saw with remarkable clearness the immense possibilities of preventive medicine under the guidance of such men as Chadwick, Budd, Simon, Farr, Ward Richardson, Buchanan, and Russell. When not talking of Bright and Addison, of Stokes and Graves, he was lauding these men, their ways, and their works. Important literary events were the arrival of Dr. Farr's Report and the Report of the medical officer of the Local Government Board, as they furnished ammunition for the year, and it was my privilege, if not always my pleasure, to dig out statistics of the various diseases or to abstract some special article. This, you may think somewhat irrelevant, statement is preliminary to an excursion I am about to ask you to make with me, not over unpathed waters, but through the familiar pages of the Registrar-General's Report—the just-issued volume for the year 1915. Custom has not made stale the awe experienced in the contemplation of its long rows of figures, the mystery of the position of the dots, and of such new expressions as standardised rates. And let me add a warning. No author of my acquaintance has been so uniformly unhappy as myself in dealing with statistics. And I have tried so hard! But there is scarcely a percentage in my Text-book that has not been challenged, and corrected, from various sources more than once. Like Lucian, then, in introducing his Vera historia, it may be well to solicit at the outset my hearers' incredulity.

The first thing to arrest attention in Sir Bernard Mallet's big Blue-book is the absence of all reference to venereal disease in the "Review of the Vital Statistics for the Year 1915," by Dr. T. H. C. Stevenson. Of 18 causes of death specially discussed, all but three belong to the infections, of which tuberculosis, pneumonia, and cancer[2] head the list—not a word about syphilis! For the report of 1912 Dr. Stevenson prepared a special discussion for the Royal Commission on Venereal Disease, and the difficulties of the whole subject, from the statistical standpoint, were exposed. The truth is, syphilis has been, and remains, the despair of the statistician. Trustworthy data are not forthcoming. Even in death a stigma is associated with it, and the returns are everywhere but under the special caption of the disease itself. Among the 11 causes of infant mortality during the first year syphilis is not mentioned, though on p. xxii. it is twice alluded to casually—the only place in which the word occurs in the 46 pages of the review! This is no reflection on Dr. Stevenson who works with material furnished by the profession.

Where, then, do venereal diseases appear? At p. 142 (International List No. 37) syphilis is stated to have been responsible for 1885 deaths at all ages, and other venereal disease for 61. Not a very heavy bill, and of the 1885 deaths, 1162 were under a year, 1277 under five years. Of the ten best killers among the infections (exclusive of the motley group of diarrhœal diseases of children) syphilis comes last. In order of potency they are (I give the round numbers), tuberculosis, 54,000; pneumonias, 49,000; cancer, 40,000; measles, 16,000; influenza, 10,000; whooping-cough, 8000; diphtheria, 6000; scarlet fever, 2400; cerebro-spinal fever, 2000.

REDUCTION OF TYPHOID FEVER.

But, Mr. President, I cannot pass these dry figures without a digression. To find syphilis among the ten great

[1] A Stoic in his Garden, and Justus Lipsius. The Library, 1915 and 1916.

[2] I put cancer with the infections to use its mortality rates.

infections may cause surprise, but this is nothing to the astonishment at the absence of what has been in so-called civilised countries the very David among infections, typhoid fever—a paltry 1400 deaths! a rate of 35 per million. For 40 years physicians everywhere have consulted these reports for the statistics of this disease as the sanitary index of the most sanitary country in the world. Where and how was this great victory won? Where do you suppose? In a Government office—of all places! At the Local Government Board—of all places! and by a group of Government officials—of all men! by Simon, and his successors! Staff work, team-work, organised administration, have solved one of the greatest of the problems of public health.

To realise the magnitude of the victory one must have lived and moved and worked year by year in typhoid-stricken countries—helpless and hopeless without proper sanitary laws, or without the power to enforce them. To have succeeded within the memory of some who hear me in reducing the mortality of typhoid fever from between 700 and 800 per million living to the low figure 35 per million is one of the decisive battles of humanity. Conditions in this country have become so healthy that even with hundreds of thousands of recruits at the most susceptible age concentrated in camps the death-rate from typhoid disease has been the lowest in our history—and there is the added triumph of an enteric-free army in France. Inoculation has done much; but the conquest of enteric fever in this country was won by honest sanitation, carefully directed from a centre by experts, and by Government experts.

Mr. President, here, if ever, we may say with Simonides, "The State is a man's teacher," and for the benefit of the timid Ionian individualist we may add Plutarch's comment—that this lesson is only learned through many a bitter struggle and experiences. The immediate purpose of this digression will appear later in my address. Let us now return to the report.

GONORRHŒA AND RACE CONSERVATION.

Content at this stage the superficial reader will have a very erroneous idea of the position of venereal disease in the nation's life; but before going deeper into its pages let me recall a few pathological and clinical details. Among the infections gonorrhœa and syphilis stand out as the great race poisons. No other germs act in precisely the same way. The gonococcus is not a great destroyer of life; the figures given for 1915 convey the truth, only some 61 deaths. This tallies with clinical experience, as the fatal complications are very rare. But the gonococcus is the greatest known preventer of life—in fact, one of its cruel properties is to sterilise a very considerable proportion of its hosts. To realise the ravages of gonorrhœa, do not consult the Blue-books or the text-books, but study the reports of the gynæcological clinics and hospitals for diseases of women. As high as 25 per cent. of the major operations may be for gonorrhœa complications, which are among the commonest sources of chronic ill-health. Conservative estimates place the percentage of sterility in women due to gonorrhœa at 50. A large majority of these women are innocent victims of infection, often innocent infection, by husbands who thought themselves free from all traces of what they regarded as a harmless indiscretion of youth, and who could have been cured under a proper system of control treatment. Then the complicating epididymitis in the male is a common cause of sterility. One recalls the dictum of Noegerrath—the founder of our modern knowledge of gonorrhœa in the female—90 per cent. sterile women have husbands who have had gonorrhœa.

From the standpoint of race conservation gonorrhœa is a disease of the very first rank, and costs the country annually thousands of lives. With 30 to 40 per cent. of all the cases of congenital blindness, with the chronic pelvic mischief in women, and with the unhappiness of sterile marriages—with these and many minor ailments scored up against it, we may say that while not a killer, as a misery producer Neisser's coccus is king among the germs.

SYPHILIS.

The spirochæte of syphilis is easily the most notable among germs. A protozoon—it is the only protozoon, indeed, it is the only germ of world-wide dominion, irrespective of race or clime. From its well worked out biology, just two points suffice for our present purpose. The first, in some ways the most important single feature in its history, is the frequency of the transmission from parent to child. Congenital tuberculosis—how rare! Congenital pneumonia—unknown!—in fact, a killing transmission in the great infections is very rare. In syphilis it stands out less as a biological peculiarity than as a fact of supreme importance in the national health. The spirochæte may kill the child in utero, a few days after birth, or within the first two years of life, or the blighted survivor may be subject to innumerable maladies.

Stillbirths.

The stillborn are at last to be numbered. Until now they have remained the "hidden untimely births," to use the language of Job. Sir Arthur Newsholme estimates them at close upon 100,000.[3] What percentage of these deaths are spirochætal we do not know. This we do know, that syphilis is perhaps the most common cause of abortion, and that in examinations which have been made in large maternity hospitals more than 25 per cent. of the stillborn have been found infected. In this stage of big figures we can afford to be liberal, so let us reject the 80, or even the 50, per cent. of some estimates and let us put the "untimely hidden births" due to syphilis at 25 per cent. and tally them at, say, 20,000 for the year 1915.

Have we any data to justify these figures? I have looked through a great deal of literature, and was not a little pleased to find from my old hospital by far the most satisfactory information. Let me state that the obstetrical department of the Johns Hopkins Hospital was begun in a very quiet way. We put a good man in charge, Dr. Whitridge Williams, who has had first-class assistants, whole-time men, and a method of teaching which has enabled him to get a great deal of work out of his students. The result has been the output of valuable knowledge and the collection of a body of experience which bears directly upon the question before us. Of the first 10,000 cases in the clinic there were 705 fœtal deaths—i.e., from the seventh month on—7·05 per cent. In all cases the placenta was examined as well as the fœtus. "By far and away the most common etiological factor in the producing death in the fœtus is syphilis," responsible for 26·4 per cent. in the series. This, too, is a low estimate, as at least 53 of the 127 macerated fœtuses were probably syphilitic, though this could not be determined microscopically. I purposely refrain from quoting the statistics, also of 10,000 cases, of the Sloan Maternity, New York, from which the syphilitic are excluded. The small but very thoroughly worked out details of 500 cases by Dr. Slemons, of Yale Medical School, give 26 per cent. An investigation is in progress in London for the Local Government Board, and I am allowed to quote the figures to date, which give only 44 positive cases in 300—a much lower percentage than I have found elsewhere. A 20 per cent. estimate would, I think, be reasonable.

Infantile Mortality.

In 1915, of 800,000 children born, 90,000 died within the first year, the lowest number yet recorded. Add this heavy loss to the intra-uterine deaths, and it makes stock-raising for the human animal a very poor business. I have no time to discuss (but I may offer congratulations on) the efforts to lower this early death-rate by Mr. Broadbent, of Huddersfield, and by his colleagues in the great child-saving work they are doing for the nation. The reports on the physical welfare of mothers and children by Dr. E. W. Hope and Dr. Janet Campbell, just issued by the Carnegie United Kingdom Trust, will prove a boon and a blessing to sanitary workers.

Of what did these 90,000 children die? First let us note that about one-fifth of these died within the first week and a fourth within the first month. Ten causes are mentioned: whooping-cough; other common infections; diarrhœa and enteritis; premature birth; congenital defects; atrophy, debility and marasmus; developmental and wasting diseases; tuberculous diseases; convulsions; bronchitis and pneumonia; and then other causes. Again, the interest in this list centres in what is not there! Shades of Fracastorius! Syphilis is not even mentioned! When I was a pathologist and physician to an infants' home, we did not have—nor did we need!—Schaudinn or Wassermann or Noguchi to tell us of what 95 per cent. of infants died during the first month. Jonathan Hutchinson and Parrot and Diday and Fournier had told us that. The Registrar-General cannot go behind

[3] Report on Child Mortality, 1916, p. 8.

his returns, but it is worthy of comment that in Dr. Stevenson's discussion on the causes of infant mortality syphilis is only mentioned twice (p. xxii.), and that casually. When we turn to the total deaths from syphilis then we do get light, as among the 1885 deaths 1162 were under 1 year, 1277 under 5 years, but these figures are far below the mark. Careful work is in progress to determine the number of deaths within the first year from syphilis, and we shall not be far wrong in placing the figure at between 15,000 and 20,000. Dr. Helen Y. Campbell, in charge of the Bradford Infants' Clinic, reports for 1915 34·30 per cent. with the clinical features of syphilis among the 207 deaths in 3010 infants under one year.

WIDESPREAD MANIFESTATIONS OF THE SPIROCHÆTE.

The second point in the biology of the spirochæte is a peculiarity it shares with many other parasites of resting dormant in the body for years. As a rule such germs, even while retaining their virulence, do little or no damage. Not so the spirochæte, whose capacity to work evil is not to be measured by years. Since Schaudinn's great discovery there is a sharper point to Sigmund's oft-repeated aphorism, "Syphilis is the worm that never dieth." *Venus impura* is a hard mistress. Venus of the long arm she should be called, as 10, 20, 30, even 40 years from the date of infection the book bills are rendered, and she wrings the uttermost farthing out of her poor victims. One plain outcome of all recent work is that the untreated or the half-treated syphilitic is a bad life. No insurance company to-day will take a man who has a Wassermann reaction. So widespread are the manifestations of the spirochæte in the body that there is truth in the paradox I was in the habit of telling my students, Study one disease, study syphilis thoroughly and you take a knowledge of all others on the way—general medicine, nearly all surgery, and certainly all the specialties.

But I see an incredulous look on some faces, and I hear the whispered comment—'tis heard often enough! "Where is all this syphilis? It does not come my way." Yes it does. The syphilis we see but do not recognise everywhere awaits diagnosis, so protean are its manifestations. My colleague at the Johns Hopkins Hospital, Lewellys Barker, in a recent paper enumerates 19.[4] A good test of the importance of a disease is to take the 37 volumes of the two series of the Index Catalogue of the Surgeon-General's Library, Washington, in which is indexed practically all medical literature between 1880 and 1917. In Vol. XVII. of the second series issued in 1912 are 207 double-columned pages of reference, against 117 pages in Vol. XIV. of the first series in 1893. No other single disease except tuberculosis has so much space devoted to it.

Syphilis illustrates the truth of the axiom that "Men do not die of the diseases that afflict them." Look up and down the columns on pp. 138–167 of the Report, and except in the figures I have already given there is no reference to syphilis, and if from the 1885 deaths you take out 1277 before the fifth year, there is left the apparently comforting assurance of only 608 deaths among adults for the year 1915. Nothing could be more misleading.

The two-century-old conviction that syphilis was responsible for a great many internal disorders (Morgagni, 1761, and Lancisi, 1728) did not really bear fruit until the seventh and eighth decades of the last century. Fournier started the ball rolling; but it was the discussion on Erb's paper, "Syphilis and Tabes," at the 1881 London Congress that roused the profession. To the distinguished Heidelberg clinician, still more to the great syphilographer, Fournier, and to that model physician in mind and method, William R. Gowers, we owe the demonstration of the important part played by syphilis in the etiology of the chronic diseases of the nervous system. I remember the discussion as if it were yesterday, and I have re-read it with no little astonishment. And yet as the actual demonstration of to-day was lacking the clearest eyes saw but through a glass darkly and we must sympathise with an opposition which was able to bring so large a body of negative evidence against the new view. The evening after the discussion an interesting incident happened at Dr. Bristowe's house. Bouchard, Erb, and one or two others talked over the subject. Bristowe, who was a waverer, emphasised the point that many physicians had locomotor ataxia who certainly had not had syphilis. Turning to me he said: "Now our mutual friend X has surely not had it—he would have told me!" I felt sorry to have to say that I had seen our mutual friend on the continent under treatment with secondary symptoms!

The improved technique by which the spirochæte is demonstrated in the tissues and the serum reactions have opened a new chapter in our knowledge of the prevalence of the disease. The profession has read it with amazement, the sanitary authorities with bewilderment, but best of all the public is actually reading the chapter in the open!

EXAMINATION OF REGISTRAR-GENERAL'S MORTALITY RETURNS.

Let us see now what the Registrar-General can tell us about the book-bills of the Cyprian. Germs show singular preferences for different parts of the body—the tubercle bacillus for the lungs and lymph glands, the *Plasmodium malariæ* for the blood, the lepra bacillus for the skin, and the *Spirochæta pallida* for the nervous system and the blood-vessels. Of the 562,000 deaths in 1915 about 58,000 were due to diseases of the nervous system. Two of these need not detain us. Locomotor ataxia and general paralysis of the insane *are* syphilis and account for 735 and 2263 deaths respectively. Now that is as much as we can say positively about the lists on pp. 146 and 148 of the Report, but let us take the other diseases in order.

A certain number of cases of meningitis are syphilitic, but they cannot be picked out from Class C—returned as "Other forms," numbering more than one-half of the total deaths from this disease. We may leave this out altogether. After locomotor ataxia comes "Other diseases of the spinal cord," 2846 deaths, a larger proportion of them in the fourth to the sixth decades. Any neurologist would say that a reasonable estimate would take at least one-half of these—say, 1500. By far the largest single cause is cerebral hæmorrhage—apoplexy—25,423, a majority of the deaths occurring after 50, beyond which age it is the privilege of any man to rupture a blood-vessel in his brain without suspicion. 3713 of these deaths were between the ages of 25 and 50, of which 3000 could be claimed as due to syphilis. "Softening of the brain" should long ago have gone into the limbo of unused terms with "rising of the lights," but there are 1472 returns under that caption; who could deny us 500 of these? The "Paralyses without specified cause," 2983 cases, is a hopeless section, but as more than two-thirds were hemiplegia we could be given at least 500. That a certain proportion of other forms of mental alienation, 1100 deaths, were cases of G.P.I. is very probable. Judging from the studies of Leonard Finlay[5] and of Fraser and Watson,[6] epilepsy, spastic diplegias, and mental deficiency are common results of congenital syphilis. The extraordinary amount of latent neuro-syphilis in the community is well brought out by the studies of Southard and his colleagues at the Boston Psychopathic Hospital. From epilepsy, infantile convulsions, and "other diseases of the nervous system," which mount up to about 15,000, we could claim a couple of thousand at least. This gives us a total from this section of about 10,000 deaths in which syphilis is a probable cause of death.

The spirochæte attacks the vascular system in preference to all other parts, and many of the deaths noted as apoplexy and meningitis, &c., are really from blood-vessel lesions. Aneurysm, the first important internal disease to be attributed to syphilis, and the aortitis on which it depends are usually spirochætal. Between the twenty-fifth and the fifty-fifth years the cases are always spirochætal; in the young they may be embolic and in the aged atheromatous. Of the 1141 deaths we could put down 1000 to syphilis. There is a terrible bill opposite organic disease of the heart, 56,000 deaths. About 17,000 of these are between the ages of 30 and 55, and a majority of these are in men. Unfortunately, valvular disease and the myocardial cases are not differentiated from the others, nor the aortic from the mitral. For reasons to be referred to later we shall be safe in taking one-third of the cases between 30 and 55—say, 5000 at least—and we may take an equal number from the 10,000 dead of diseases of the arteries, atheroma and aneurysm. A low estimate would put the cardio-vascular deaths due to syphilis at above 10,000.

It is unnecessary to bring in the comparatively small number contributed by other organs, the liver, lungs,

[4] Medical News, Feb. 26th, 1916.

[5] Glasgow Med. Jour., 1914.

[6] Journal of Mental Science, 1913.

larynx, kidneys. We have enough to put the grand total of the ravages of the *Spirochæta pallida* above 60,000, and to move syphilis from the tenth place in the Registrar-General's Report to which it belongs—*at the top, an easy first among the infections*. Many years ago in the "Life and Death of Mr. Badman," I came across Bunyan's phrase the "Captain of the Men of Death," which "caught on" in the literature. In his day it may have been true of consumption; it is so no longer; the headship in temperate climates belongs undoubtedly to syphilis.

POST-MORTEM EVIDENCE.

It was not without reason, some of you may now think, that I entreated my hearers' incredulity. There is a hazy uncertainty about these figures, I admit, but we shall find they are understated, not overstated. So impressed have clinicians and pathologists been with the absence of clear-cut evidence that in all parts of the world investigations are in progress dealing with the incidence of syphilis in ordinary hospital work. I cannot begin to quote all the papers, but I may refer to a few just to make you feel less incredulous about the character of my claims.

Dr. Warthin,[7] one of the best known of American pathologists, whose technique is only equalled by his patience and thoroughness, investigated the tissues in a series of consecutive post-mortems with the most scrupulous care to determine the existence of the spirochæte. One-third of the autopsies in adults showed its presence somewhere in the organs. Of these 41 cases only 11 were known to have had syphilis, 5 had active lesions in the nervous system, and 25 had shown no clinical changes suggestive of syphilis. In 36 there were syphilitic lesions in the heart (spirochætes demonstrated), 32 in the aorta, 31 in the testicles, 4 in the liver, and 6 in the adrenals. He concludes that interstitial myocarditis, aortitis, and fibrous orchitis form a triad distinctively spirochætal. The material from which this study was made represents an average intake of a hospital supplied largely from the country and from smaller towns of the State of Michigan. It would be interesting to repeat in one of the large London hospitals a similar study in 500 bodies, though the prolonged and tedious character of the work makes it almost impossible unless a special staff (after the war) could be appointed. It is the type of work that carries conviction, as the parasites are demonstrated in the lesions.

THE WASSERMANN REACTION.

The other method of inquiry does not carry the same weight. Not that the Wassermann reaction is not a satisfactory test of the presence of syphilis, but the technique is delicate and beset with difficulties that may vitiate the results. I will only refer, then, to studies made under the control of men I know, and with as great care as possible to perfection of the technique. C. H. Browning's paper[8] gives many details from English and Scotch sources.

My native country has a Conservation Commission which deals with everything from babies to beavers. I do not know the circumstances under which the Commission called for a report on the prevalence of venereal diseases, but they asked the members of the staff of the new Toronto General Hospital to undertake the work, and their report just issued (Jan. 17th, 1917) deals with all aspects of the problem. The point of interest here is that from 12 to 14 per cent. of patients admitted to the hospital show serological reactions characteristic of syphilis. In 60 per cent. of these persons the disease was not suspected. That the observations were made by Dr. Detweiler in the laboratory of Professor J. J. Mackenzie is a sufficient guarantee of the character of technique carried out.

The Brigham Hospital, Boston, is a new research hospital on the most advanced lines. Of 4000 patients examined by Walker and Haller,[9] 600 had been infected—15 per cent. Here again the latent cases far outnumber the active. In Baltimore Dr. George Walker, a well-known specialist, examined 1080 patients, 10 per cent. of whom gave the reaction. Of 327 prostitutes, 67 per cent. were infected.[10] Dr. John H. Musser, jun., reports that the examination of cases at the University Hospital, Philadelphia, gave 14 per cent. with the specific reactions for syphilis.

[7] American Journal of the Medical Sciences, 1916.
[8] Brit. Med. Jour., 1914, 1.
[9] Journal of American Medical Association, 1916, 1.
[10] Ibid., lxxvi., 1738.

I know there are those who look askance at the results of the Wassermann reaction which has not, and does not claim, mathematical accuracy, and it is a test on which much depends in the personal skill and honesty of the pathologist. These figures, from sources well known to me personally, may be trusted as far as one can such slippery articles. Modern research everywhere leads to three conclusions: (1) that there is an immense body of latent syphilis in the community; (2) that a very large number of persons have not been thoroughly treated; and (3) that to the enormous groups of cerebro-spinal and cardio-vascular deaths syphilis is an all-important contributor.

GROWTH OF CAMPAIGN AGAINST VENEREAL DISEASES.

The discovery of the spirochæte in 1905 gave an enormous impetus to the study of syphilis, while the improved treatment announced by Ehrlich in 1910 aroused hopes that at last—with the cause known and the cure assured—we had in our hands weapons for an effective fight. The public and its incorporated activities, the State, had persistently ignored its existence. Centuries of silence had made venereal disease taboo. Press and pulpit alike ignored the unsavoury subject. I doubt if the word syphilis occurs in the index of the *Times* until 1910, when a brief announcement of Ehrlich's discovery was made. Venereal diseases are rarely mentioned until the recent Commission, though, of course, a great deal of discussion took place upon the Contagious Diseases Acts History repeats itself. Imperial Rome is said to have been one huge brothel, in which sexual diseases were rife, though whether syphilis was one of them we do not know. The bibliophile Jacob (Paul Lecroix, who is also Pierre Dufour of the great work on prostitution) calls attention[11] to the hesitancy with which the Latin writers, medical and lay, refer to the *morbus indecens*, or, indeed, to any sexual disorder. To the rapid increase of venereal disease in them he attributes the appointment of State physicians by Nero.[12]

The beginning of the twentieth century saw us in a condition of hopeless apathy. Within a decade what a changed attitude in profession and public! You, Mr. President, started the former by the issue of your six-volume "System of Syphilis," which has proved such a useful armoury. Dr. Johnstone's report was an "eye-opener." The Royal Commission appointed in 1913 gave practical expression to a realisation of the importance of the problem by the public. Best of all, Lord Sydenham's report has not been sterile, as is so often the case with Royal Commissions. The rapidity with which it fertilised the House of Commons is unparalleled in the history of even that prolific lady. An outcome, too, of the work of the Commission was the founding in 1914 of the National Council for Combating Venereal Diseases, the primary function of which is educational. Under the wise guidance of Sir Thomas Barlow the Council has provided accurate and enlightened information to the public, and has

[11] Recherches Historiques sur les Maladies de Venus, Bruxelles, 1883.

[12] The question of the existence of syphilis in Graeco-Roman times has been re-opened with the proof of the presence of the disease in Europe before the discovery of America. I have asked Mr. Warde Fowler, the well-known authority in Roman social life, what he thinks of the bibliophile Jacob's statement. His reply is worth quoting:—"In my judgment the question depends on the evidence of Celsus entirely; all the rest which Jacob adduces is vague and indirect, and apt to give way when you probe it. For example, he makes a great point of slave doctors kept in big establishments, who would keep unpleasant diseases secret, and so on. I have looked up the evidence about these, and there is nothing more in it than that in a few very big establishments it was convenient to have a doctor on the spot, as in a big ship. The economy of those big households or farms was self-sufficing, in this as in other ways. And it was far from universal even in large farms, for Varro expressly says that farmers preferred to use the doctors of the neighbourhood. Again, he quotes St. Augustine for the Syrian luxury that came to Rome in the second century B.C., and jumps to the conclusion that all kinds of evil diseases came with it. That may have been so, but it does not come out of Augustine's words; and I am pretty sure that if Augustine had wanted to say so, he would have said it without any scruple. But, on the other hand, supposing that the passage quoted from Celsus distinctly points to syphilis or something like it, the fact that there is no mention of such things in Roman literature would not be enough to damage Celsus's evidence. What survives of Roman literature is mostly clean and in good tone, and one would not expect to find any such allusion in it. The absence of any allusion in certain poems of Catullus, and in the great passage about love at the end of the fourth book of Lucretius, might suggest that one shou'd be careful about interpreting Celsus, but would by no means be decisive. (I have just been over the Lucretius passage, and can find no trace of allusion to a morbus; and L. was very plain-spoken in such matters.) So I think that you must go by Celsus alone. Apart from him I should say there is no evidence of any weight, positive or negative." The difficulty with Celsus is a matter of interpretation. The lesions described are not necessarily sexual.

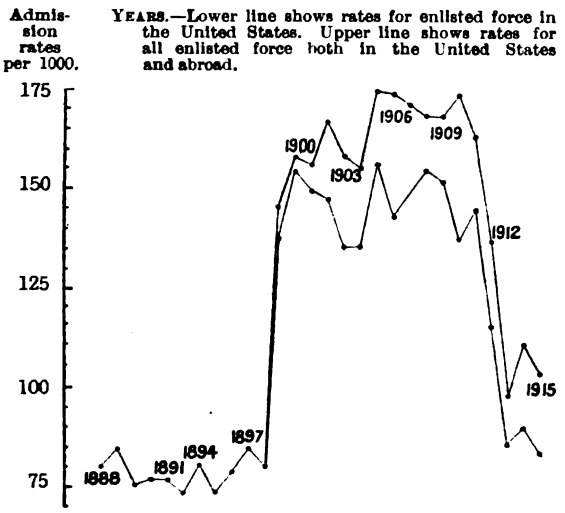
been a rallying centre for the various professional bodies interested in the subject. The work of the Eugenic Education Society under Major Darwin has been most helpful.

The outset of the great war has stimulated, not retarded, the plan of campaign. Since that memorable scene which shook the gods in Olympus with inextinguishable laughter Venus and Mars have been inseparable. War means an enormous increase in the number of infections. The last quoted figures for the British Army at home are (Hansard, April 23rd): 71,000 cases of gonorrhœa, 21,000 cases of syphilis, and 6000 cases of soft chancre. In the Canadian Army to March 31st, 1917, there have been 18,335 cases of venereal disease—figures which have stirred public opinion in the Dominions to the boiling point.

LEGISLATIVE ACTION.

Stricter prophylaxis should reduce these figures. I have had from Colonel Bradley, U.S.A., and Major Lyster, U.S.A., now stationed in England, the full details of the methods now carried out so successfully in the United States Army.

The annexed chart speaks for itself:—



1888-98.—During this decade the Army was stationed throughout the United States principally at small posts. No compulsory physical inspection; no systematic propaganda to reduce venereal disease. The rates represent practically those patients unable to do duty. Cases not treated or those doing duty were usually not recorded.
1898.—Spanish War. Militia called into service.
1898-99.—Great change in Army; marked expansion. Old soldiers disappear; volunteers come in. Young recruits sent to Cuba, Porto Rico, Philippines.
1899-1901.—Philippine Insurrection. Troops in Cuba, Porto Rico, China.
1901-09.—High rates prevail in United States and abroad.
1909-11.—Principles of preventive medicine applied; prophylaxis urged.
1911.—Syphilis increases. Wassermann test used in diagnosis.
1912.—Systematic measures. Fortnightly physical inspections and prophylaxis enforced by G.O., May 31st. Pay stopped, G.O. 31.
1914-15.—Concentration on Mexican border.

Various stimuli, public and private, have had at last the desired effect. The Government felt that opinion in the country was strong enough to act on the advice of the Commission and hand over the venereal problem to the public health authorities represented by the Local Government Board. The most sensible single bit of evidence given to the Commission was expressed by the Hon. Miss Brodrick, a trained nurse, that we should deal with the disease "as if it were small-pox or scarlet fever, simply as a disease quite apart from the moral side." This is what the Government has done. Recognising the existence of the disease as a great menace to public health, legislation has been enacted to fight the enemy on a settled plan at many centres under the control of the Local Government Board. It is a new departure to deal with an individual disease in this way.

What a change a single word may effect! Tuberculosis, the white plague, is really a more hopeful disease to fight than syphilis. Though it has the same strong allies, poverty and drink, there is absent the complicating problem of prostitution. The word "may" instead of "shall" in the Tuberculosis Act gave us an ineffective guerilla warfare of local bodies for a Kitchener and a general staff. The Government made no mistake this time—*shall* is the word, and all over the country the clinics are in course of formation. Nurtured upon the Reports of the Local Government Board, I dwelt with a purpose on the successful campaign which it had waged against typhoid fever. In that great warfare Sir John Simon was chief of staff, and the battle was won by able lieutenants who directed the actual fighting in various parts of the country. Read the story in his writings, and you will wonder how it ever could have been accomplished, against the opposition of Dogberrys inside and outside the House. Had the country listened to Sir John Simon half a century ago, when he advocated the "urgent need of control of the public health by a responsible Minister of State," our arrears in infant mortality and housing would not now be so heavy. Still, let us be grateful to him and to his successors for all the good work that has been done.

ESTABLISHMENT OF VENEREAL CLINICS.

No more hopeful legislation has ever been enacted than the establishment of these venereal clinics, with which the country will be equipped, though not fully, for the battle. But let the people and their representatives realise that they are dealing with the subtlest foe of humanity and the greatest sanitary problem which confronts civilisation. A general staff, controlling the campaign, will work from the Local Government Board (or before long, let us hope, from a Ministry of Health[13]) with laboratory, statistical, and social service departments, a publicity bureau and a library. The centres will be units working with a single object, and the doctors, nurses, and social workers will be members of a great national army.

Already the Commission—for it is its work—has done what the profession has not been able to do in these long years—opened the doors of the general hospitals to these victims. The governors and trustees have lined up at last with the good Samaritan. There are many institutions in which an up-to-date scientific clinic with laboratories will be a great boon. The profession welcomes the scheme from the educational side, as there will be within easy reach opportunities for the study of all aspects of both disorders, and from the practical side they will be able to bring their patients freely for special treatment, for special consultation, and for the laboratory tests which are so essential. There will, I hope, be at each centre lectures and demonstrations as have been organised in Liverpool. A sympathetic and loyal feeling on the part of the practitioners in each district is really essential to the success of the work.

Between the clinical and the laboratory side there will be enough at each clinic to occupy a large part of the time of a male and female doctor, who will, I trust, become the skilled advisers of the profession and of the public in each district. It should be our business to make these positions sufficiently attractive to catch the very best, and I am sure the hospital authorities will welcome them warmly as members on the staff. In large cities they might well be whole-time positions, though I should prefer to allow their colleagues and the public to have the benefit of their ever-increasing experience. A great missionary field will be opened for women doctors, who should do the work among their own sex at the clinics.

EDUCATION OF THE PUBLIC.

Nowadays, in the hospitals the individual is studied and cared for, not solely his or her disease. Social workers of the right sort with the right spirit, the helpful sympathetic spirit which—

> "Gently scans your brother man,
> Still gentler sister woman,"

will do much to make the clinics known and appreciated. The National Council could very well supervise this work which should be done by carefully selected volunteers. The clinic should be the centre in each district of an active educational propaganda which should be stimulated and planned by the general staff, and not left to the timid discretion of the local authorities. By meetings, literature, placards—in every legitimate way—a knowledge of the dangers of venereal disease should be distributed, and the importance of early and thorough treatment insisted upon. The public lavatories, the toilet-rooms of restaurants,

[13] The Waldorf Astor Report just issued, "The Health of the People: a New National Policy," should give a great stimulus to the unification of the many departments at present dealing with public health.

railway stations, hotels, and factories should be utilised in a crusade against advertising venereal quacks. The stage should be used actively, and such a play as Brieux's "Damaged Goods," while strong meat for the *young*, enforces on young men the lesson of the terrible risks better than the chapters in *Proverbs* or than any number of leaflets.

In every possible way the sympathetic coöperation of the public is to be sought. Get people to realise that it is a great communicable disease two-thirds of the victims of which are innocent, and much will be done to break down the present barriers of ignorance and false sentiment. For any legislation to be successful the people must be prepared. The problem bristles with difficulties, but the primary duty is to gain the confidence of the public and respect their feelings so far as they are consistent with the welfare of the State.

UNQUALIFIED TREATMENT.—NOTIFICATION.—COMPULSORY TREATMENT.

We are committed, then, to a campaign of education, and an elaborate scheme of treatment. Two circumstances make it probable that these measures—and a good beginning, let us grant—will not suffice in themselves to reach the enemy.

So deep is the stigma associated with the disease that patients avoid hospitals—even their family doctors—preferring quacks and others who promise a speedy cure. Legislation is in progress to prevent unauthorised treatment of the disease. The active sympathy should be sought of the 5000 men calling themselves herbalists, referred to by Mr. Hayes Fisher in the House. (Hansard, April 23rd, 1917.) I am sure the profession has no wish to interfere seriously with a calling which ministers to a thirst for "simples" so Gargantuan. These men have families and could be interested in public health; many of them are good botanists and of above the average intelligence. They know that syphilis and gonorrhœa are quite beyond the reach of herbs, and that even guaiacum—the holy wood—no longer avails.

To be successful in any fight the primary essential is to know where your enemy is placed. The Commission did not feel able to recommend confidential notification, nor does the new Act enforce it. Perhaps they were wise and knew their business better than some of us who advocate it. Realising as fully as anyone the strong arguments against notification, the gravity of the situation outweighs with me all private considerations, and I feel sure that within a year we shall be ready for the change. It works well, we are told, in Scandinavian countries, and it will be interesting to have the results from those Australian dominions in which it has been introduced.

Another point really more serious is also associated with notification. Both syphilis and gonorrhœa require protracted treatment. It is the partially or badly treated cases that come to us 10 to 20 years later with aneurysm or nervous breakdown. The primary symptoms are often so slight that it is impossible to get patients to continue a course of medication lasting a year or even more. Here is where the clinics will be on trial, and we shall watch their experience anxiously. I see reports from a Boston hospital at which 28 per cent. of the patients did not return, and to a New York venereal clinic 29 per cent. of the syphilitics came but once. To be successful in this fight we must have control of the patients—the treatment must be compulsory. It is so in the Army, from which the men with syphilis and gonorrhœa are not to be allowed to return to private life until a reasonable guarantee is given in each case of cure. If the House of Commons in any way represents outside opinion the public is a long way from appreciating the appalling risks they run. Though on the street to-day, the spirochæte may be in your home to-morrow. The very reasonable proposals of Captain Guest, Mr. Rawlinson, and Sir H. Greenwood (Hansard, April 30th), that sanitary and curative measures should be adopted in the case of persons, men and women, convicted of certain definite offences, was met by cries of ruthlessness and Prussianism. The probation officers and workers of the London Diocesan Police-court Mission know what they are talking about when they urge compulsory detention and treatment. Practised with Mars, it is no sex inequality to do the same with Venus, but the Government is committed, for a time at least, to a policy of persuasion, feeling that notification and compulsory treatment are too far in advance of public opinion. Mr. John Burns (Hansard, April 30th) thinks that the Local Government Board has the power to deal with the question of notification. I doubt if it could enforce the treatment of syphilis any more than it does in the case of tuberculosis.

THE OUTLOOK.

To many the venereal situation looks dark and hopeless. It is not. For the first time in history the outlook is bright, despite the fact of an inevitable increase of cases during and after the war. Three things have happened to justify this hope.

The public is at least awake to the necessity of an educational campaign, in which the appalling dangers of the disease shall be brought home plainly. Other means than those heretofore must be brought to bear in a full and free enlightenment upon the subject. Such literature as Corbett-Smith's "Problem of the Nations" and the various publications of the National Council are having an enormous influence. That the preaching of chastity appears a ghastly failure, in the face of the record of 800,000 fresh cases annually in this Christian kingdom (Melville White's estimate), is no reason why the earnest appeal for personal purity should not take the first place in the educational campaign. Where the Apostles had to confess defeat their successors need not feel discouraged, and had they not laboured so hard for so long the percentage of the poxed in the community might have been doubled. The reproach is not upon Christianity but upon earthen vessels too frail to hold it. Venereal disease has been called a bi-sexual problem. Patrol beside St. Martin's Church at this hour and you would be inclined to deny it; but remember, for the aggressive harlotage that still disgraces our streets man is primarily responsible. The blame, but not always the burden, is upon him. The pity of it is that the strong offences' cross is borne, not always by the offender, how much soever he may sorrow, but by innocent women and children who form more than one-half of the victims.

That the State has at last intervened is another ground for hope. In the matter of health you may trust the people. Once get democracy to realise that it is badly diseased and it displays a Job-like regard for its skin. Has not Tammany, a very synonym for corruption, given New York City the most progressive, up-to-date system of sanitation in the world? You will have gathered, Mr. President, that I am a strong advocate of strong central control in these matters. My inspiration does not come from Hegel or his bastard modern disciples, but from the fountain-head, the great teacher who tried in vain to bring the Athenians back to "thoughts of order, to disinterestedness in their functions, to that self-concentration of soul in one's own part, that loyal concession of their proper parts to others on which such order depends."[14] Plato tells us "States are as the men are; they grow out of human characters." How chastened has been the strong Ionian element in British life! The war has brought to the individual a Dorian realisation of duty never before witnessed. All that a man hath—all that he holds dearest are drawn into a new ideal of service to the State. It will not be so hard after this schooling to accept an ever-increasing control of the disease by a Ministry of Health, with notification and compulsory treatment.

Most hopeful of all is the changed heart of the people. At last the sinner is to receive Christian treatment. Above the mantelpiece of his library hung what the founder of my old school, the Rev. W. A. Johnson (Trinity College School, near Toronto), used to call the Magna Charta of humanity. In the centre of the most dramatic scene in the Gospels stood the woman taken in adultery. About her thronged the Scribes and Pharisees, with eyes turned from her to the Christ, stooping as he wrote with his finger on the ground the watch-words of the New Dispensation—"He that is without sin among you, let him first cast a stone at her." I should like to see a copy of this picture in every one of the new clinics in testimony that we have at last reached the full meaning of the priceless message, "Neither do I condemn thee; go, sin no more."

Fighting in this spirit, the soldiers of our "New Model" will put up an irresistible barrage against the most formidable enemy of the race—an enemy entrenched behind the strongest of human passions, and the deepest of social prejudices.

[14] Pater: Plato and Platonism, 1893, p. 216.

A BLOOD CHANGE IN GAS POISONING.

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IN conjunction with my colleague, Captain Harry Rainy, I published a note on a new sign in Gas Poisoning in THE LANCET of Jan. 6th, dealing with some fourteen cases of the condition admitted to No. 2 Scottish General Hospital during the month of September last. Since that date the investigation has been carried out in my laboratory upon cases in Craigleith Hospital and the auxiliary hospitals in the Edinburgh area.

TABLE I.—*General Survey of the Cases, Excluding the 14 Already Recorded.*

No.	Polymorphs.	Lymphocytes.	Mononuclears.	Eosinophils.	Mast.	Period between gassing and examination.	Immediate symptoms.	Symptoms at time of examination.
15	36·2	55·4	2·3	5·08	0·4	1 m.	Twice gassed, unconscious second time.	Vomiting, dyspepsia, pains in head.
16	75·7	21·7	1·2	1·2	—	2 ,,	Unconscious.	Cough, tightness in chest.
17	49·3	45·6	3·0	2·0	—	—	—	—
18	54·5	36·3	4·0	4·5	0·6	—	—	—
19	56·2	37·0	1·9	3·9	0·9	1 m.	Choking sensation.	No symptoms.
20	53·8	38·6	4·3	2·1	1·2	6 ,,	Slight case.	,, ,,
21	40·3	54·8	1·8	2·4	0·6	13 ,,	,, ,,	Gastric pain, vomiting, losing weight.
22	58·5	37·4	2·5	1·1	0·2	12 ,,	Lost power of legs, but did not go sick.	Shortness of breath.
23	57·5	35·2	6·7	0·3	—	17 ,,	Slight case.	Chronic otitis media, no present symptoms.
24	59·9	37·9	1·1	0·5	0·3	1 ,,	Could not eat food for several days; stretcher case.	No symptoms. Suffering from scabies; discharged fit.
25	47·2	48·3	1·6	2·4	0·2	3 ,,	Became unconscious 4-5 hrs. after attack.	Languid, breathless, has sick spells.
26	32·1	63·7	2·8	0·9	0·3	3 ,,	Became unconscious in 1½ hrs. after attack.	Headache, cough, breathlessness.
27	50·5	43·2	2·5	3·5	0·5	12 ,,	Unconscious 4 days.	Has frequent attacks like pneumonia which last 3-4 days and subside.
28	52·4	43·7	1·5	1·8	0·3	3 ,,	Cough and breathlessness.	Cough persists, but is much improved.
29	70·3	26·9	1·1	1·4	—	3 ,,	Cough, vomiting, and unconscious.	Dyspnœa and pain in chest.
30	53·2	41·9	0·9	3·8	—	2 ,,	,, ,,	,, ,,
31	49·4	49·4	0·9	0·3	—	3 ,,	Slight cough, copious catarrh.	Cough and spit.
32	56·4	41·7	0·4	1·3	—	3 ,,	Vomiting, severe headache.	Severe headache.
33	35·5	56·2	3·0	5·0	0·5	1 ,,	Vomited; stretcher case.	Dyspnœa and pain in chest.
34	47·0	49·0	1·08	1·9	0·2	3 ,,	,, ,,	,, ,,
35	50·4	44·6	1·7	3·2	—	12 ,,	No symptoms.	No symptoms.
36	68·0	30·0	2·0	—	—	2 ,,	Vomited.	Tight feeling in chest.
37	37·8	54·8	2·6	3·5	1·1	12 ,,	Cough and vomiting.	Wheezing and cough
38	56·3	39·3	1·7	2·7	—	4 ,,	Not unconscious; vomiting not severe.	Bronchitis.
39	44·0	54·3	0·3	1·3	—	1½ ,,	Unconscious 4 hours; very severe case.	Breathlessness; tightness in chest; giddiness.
40	66·7	35·3	2·0	2·0	—	11 ,,	Unconscious 2 hours; back to duty in 6 days.	Complains of shortness of breath.
41	50·0	45·0	3·0	2·0	—	6 ,,	Did not feel much at time. A few days after, cough and breathlessness	Bronchitis.
42	59·4	34·9	2·9	1·8	1·0	20 y.	In bed with bronchitis for 5 weeks. Indigestion and bronchitis for 6 months thereafter.	None, but liable to bronchitis.
43	56·6	35·2	6·7	1·5	—	15 ,,	Pain, choking sensation, bronchitis lasting 3 weeks.	Almost complete loss of sense of smell.
44	47·7	47·5	4·0	0·4	0·4	2 m.	Slight.	Breathlessness and cough.

M, months; Y, years.

I gladly take this opportunity of thanking Major David Wallace, C.M.G., Red Cross Commissioner for the district, Dr. Graham Brown, and Miss C. M. C. MacNeil, M.B., of Seafield Military Hospital, Leith, and my colleagues in No. 2 Scottish General Hospital, for facilities in the work, and for notes of cases. I would specially mention Captain D. J. Glen, who has been of great assistance in finding out cases as they came into hospital. For the laborious work of making the blood counts I have to thank my assistants, Miss Jean McLean, M.D., and Mr. Malcolm Smith. The differential counts have in every instance been made upon at least 300 leucocytes, and they have been controlled by several observers and by repeated examination.

Investigation of Blood Changes.

The further investigation of the matter has merely confirmed the preliminary work as regards the main thesis, while modifying the conclusions in one or two respects.

Table I. gives a general survey of the cases, excluding the original 14, with differential count, period elapsed since gassing, the immediate symptoms, and the symptoms at the time of examination. The statement in the original note that this change takes some time to develop, probably three to four months, has to be modified to this extent, that in severe cases the sign appears within a month or six weeks of the gassing, possibly sooner. Cases 33 and 39 show this to be the case. Our original statement was based upon Case 16, which eventually proved to be a much milder case of gassing than the statement of the man led us to believe, the man having since returned to duty.

In order to ascertain whether the relative lymphocytosis was due to an actual increase in the number of lymphocytes or to a diminution in the polymorphonuclear leucocytes, Table II. has been drawn.

TABLE II.

No.	—	Leuc. per c.mm.	Percentage. P.M.	Percentage. L.	Total. P.M.	Total. L.
	Normal Minimum.	5,500	70	20	3,850	1,100
	Normal Average.	7,000			4,900	1,400
	Normal Maximum.	9,000			6,300	1,800
1	Severe case.	5,000	50	40	3,500	2,930
3	Persistent symptoms.	5,968	47	44	2,820	2,676
4	,, ,,	6,570	33	60	2,168	3,942
6	,, ,,	6,500	51	45	3,315	2,925
7	Slight case.	7,812	58	35	4,530	2,734
9	Severe case.	6,562	39	51	2,593	3,360
10	Very slight case.	8,124	62	30	5,036	2,437
11	,, ,,	7,184	72	23	5,047	1,638
16	Severe case.	9,686	75	21	7,264	2,034
12	,, ,,	5,000	35	58	1,750	2,900
13	Severe case (1st examination).	8,122	47	47	3,816	3,816
39	Severe case.	11,562	50	46	5,781	5,300
15	Severe case (2nd examination).	17,000	37	58	6,401	10,034
13	,, ,, ,,	15,000	44	46	6,600	6,900

Table II. gives a series of cases taken at random in which a leucocyte count was made in addition to the differential count. From the two data—number of leucocytes per c.mm. and percentage of the two main types found—the actual number of lymphocytes and polymorphonuclear leucocytes has been given in figures. The first lines of the table give the average in normal cases at what may be taken as the physiological limits and the mean.[1] This table shows that in all cases in which the sign is marked—i.e., in the cases in Table II., with the exception of Nos. 10, 11, and 16, which were slight, there is an absolute increase in the number of lymphocytes. In certain cases there is some diminution in the number of polymorphonuclear leucocytes, which tends to accentuate the sign, but the lymphocytosis is, nevertheless, an absolute one. Moreover, in Cases 13 and 15, which show a fairly well-marked leucocytosis, there is still a lymphocytosis. These cases are given in detail below.

Table III. classifies the cases according to the degree of lymphocytosis.

It will be seen that all with a count of 50 per cent. or more of lymphocytes are severe cases, with the exception of No. 21, which was a slight case of gassing, but the symptoms have persisted to the present time—i.e., 13 months after the gassing. Of those with a lymphocyte count of 40 per cent. or over, all, with the exception of two, Nos. 31 and 35, are severe cases or cases with persistent symptoms. Too much stress cannot, of course, be laid on these percentages, but we have found that they are wonderfully constant on repeated examination and by different observers.

[1] Gulland and Goodall: The Blood, second edition, p. 78.

TABLE III.—*Cases with High Lymphocyte Count.*

(A.) *Count of over 50 per cent.*

No.	Lympho-cytes.	Interval in months.	Symptoms.
8	56·3	12	Severe case, unconscious 4 hours.
9	51·7	11	Fairly severe, dazed, cough still.
12	58·2	17	Severe case, unconscious.
21	54·8	13	Slight persistent gastric symptoms.
37	54·8	12	Fairly severe, cough and wheezing still.
4	60·0	5	Severe case, symptoms still.
15	55·4	1	Severe case, persistent symptoms.
26	63·7	3	Severe case, unconscious.
33	56·2	1	Severe case, vomiting.
39	54·3	1½	Severe case, unconscious.

(B.) *Count of over 40 per cent.*

3	44·6	12	Marked case, eye symptoms still.
6	45·2	12	Fairly severe, eye symptoms still.
13	47·6	12	Severe case, unconscious.
27	43·2	12	Severe case, still symptoms.
35	44·6	12	Slight case, no present symptoms.
1	40·8	3	Severe case.
2	40·0	3	Marked symptoms.
14	40·0	(2)	Partly unconscious, symptoms still.
25	48·3	3	Unconscious.
28	43·7	3	Slight case.
30	41 9	2	Unconscious.
31	49·4	3	Slight.
32	41·7	3	Vomited, headaches.
34	49·0	3	Vomited, stretcher case.
41	45·0	6	Fairly severe case, symptoms still.
44	47·5	2	Slight case, persistent symptoms.

A classification of the cases according to the period which has elapsed since the gassing (Table IV.) does not yield any very definite information beyond the fact that the sign is a wonderfully persistent one, and has not disappeared in any instance in my experience.

In this relation I was fortunate in being able to examine the blood of two schoolmasters (Cases 42 and 43) who had been gassed with chlorine, the one 15 and the other 20 years previously. Both suffered severely at the time and symptoms persisted, in the one for some weeks and in the other for many months. The counts in each instance give a slight relative increase of lymphocytes, but they are probably not outside the limits of error.

TABLE IV.

9 and over 9 months.

No.	Months elapsed.	Symptoms.	P.M.	Lymph.
3	12	Marked case with eye symptoms.	47·6	44·6
5	12	Slight case.	59·2	33·4
6	12	Fairly severe with eye symptoms.	51·1	45·2
8	12	Severe, unconscious for 4 hours.	37·5	56 3
9	11	Fairly severe, dazed, cough still.	39·9	51·7
10	12	Slight case, no present symptoms.	62·3	30·2
11	9	" " " "	72·1	23·4
12	17	Severe case, unconscious.	35·3	58·2
13	12	Severe case, unconscious, but no symptoms now.	47·9	47·6
21	13	Slight case.	40·3	54·8
22	12	Did not go sick, still breathless.	58·5	37·4
23	17	Slight case, no present symptoms.	57·5	35·2
27	12	Severe case, still complains.	50·5	43·2
35	12	Slight case, no present symptoms.	50·4	44·6
37	12	Fairly severe, cough and wheezing still.	37·8	54·8
40	11	Fairly severe, symptoms still present.	66·7	35·3
		6 or under 6 months.		
1	3	Nausea, severe gassing.	50·2	40·8
2	3	Marked symptoms, symptoms still.	53·1	40·0
4	5	Severe, symptoms still.	33·5	60·0
7	2	Very slight case.	58·5	35·0
14	2	Half unconscious, slight symptoms still.	50·0	40·0
15	1	Twice gassed, unconscious, symptoms still.	36·2	55·4
16	2	Unconscious.	75·7	21·7
19	1	Choking sensation.	56·2	37·0
20	6	Slight case.	53·8	38·6
24	1	Stretcher case.	59 9	37·9
25	3	Unconscious.	47·2	48·3
26	3	"	32·1	63·7
28	3	Slight cough, breathlessness.	52·4	43·7
29	3	Unconscious.	70·3	26·9
30	2	"	53·2	41·9
31	3	Slight case.	49·4	49·4
32	3	Vomiting and headache.	56·4	41·7
33	1	Vomiting, stretcher case.	35·5	56·2
34	3	Vomited, stretcher case.	47·0	49·0
36	2	Slight case.	68·0	30·0
38	4	Vomiting, persistent bronchitis.	56·3	39·3
39	1½	Severe case.	44·0	54·3
41	6	Fairly severe, persistent bronchitis.	50·0	45·0
44	2	Slight case, persistent bronchitis.	47·7	47·5

As regards the type of gassing (i.e., whether cloud or shell) it was not always possible to get a decided answer.

Of the cases in which a definite statement was obtained 16 were cases of cloud-gassing and 16 cases of shell-gassing. As regards the further question of the chemical nature of the gas nothing decided can be stated. Sometimes the men described the smell and first sensations produced by the gas, but usually, as might be imagined, their minds were not very clear on this point.

The type of gassing and the chemical nature of the gas do not, however, appear to make any difference as regards the blood change. Of the 10 cases in which the lymphocyte count is over 50 per cent. 4 were definitely cases of cloud-gas poisoning and 4 were cases of shell-gassing. In the other 2 the nature of the gassing was uncertain.

In 8 cases the statement was volunteered that the gas was of British origin. In 24 it was either certainly or probably German.

Classification: Cases with Counts Approximating to Normal.

On investigating the cases a little more closely they may be classified into groups. In the first place, a group the counts of which approximate more or less closely to the normal, which are, in other words, either normal or within the limits of error. Of these six—viz., Nos. 5, 10, 11, 19, 22, and 23—are definitely slight cases in which the gassing was a secondary consideration. Taking No. 22 as an example:—

No. 22.—Man gassed on Sept. 25th, 1915, through lifting his helmet for a couple of seconds only. He lost the power of his legs for some ten minutes, but did not vomit. He has always suffered from bronchitis and asthma, but has been worse since the gassing. He did not go sick until some time afterwards, but he has since been dismissed from the Army on account of his asthma. This is a case in which a condition previously present was aggravated by gassing, but clearly the actual gassing was not severe.

There is another series of cases in which counts approximately normal were obtained but in which the gassing was moderately severe. These require a rather more careful scrutiny. Such are Nos. 16, 24, 29, 36, 38, and 40.

No. 16.—Man gassed in July, 1916. His statement is that he was rendered unconscious, and he complained when admitted to hospital of cough and tightness in the chest. He was sent to a convalescent home soon after, where he was punished for breaking bounds, and he has since rejoined his unit and has received promotion. It is clear that he cannot have been a severe case of gas poisoning.

No. 24.—Man gassed with cloud gas in August, 1916, through not having his helmet on. He was not rendered unconscious, but had to be carried back on a stretcher. He could not eat food for several days. He suffered from cough. His symptoms had practically disappeared before admission to hospital. A note from the medical officer of the convalescent home to which he was sent states that he had neither gastric nor pulmonary symptoms when discharged. He has since rejoined his unit.

No. 29.—Man gassed with shell gas at end of July, 1916. He had no helmet on and suffered from vomiting and breathlessness at once. These symptoms continued. Fourteen hours later he became unconscious and remained so all day. He continued to suffer from cough with expectoration, and when admitted to hospital complained of breathlessness on exertion and pain in chest. No heart lesion found on auscultation. Although showing an almost normal blood count on Oct. 25th, the count a month later was as follows: Polymorphs, 58·7; lymphocytes, 39·3. The man was suffering from psoriasis. This man volunteered the statement that the gas smelt like ammonia.

No. 38.—Man gassed at same time as No. 29. He states that the gas which was shell had a sickly sweet odour. He vomited immediately, but had no cough or breathlessness and did not become unconscious. He was able to put on his helmet. He continued in action all night and felt better in the morning. His age is 41, and he has suffered from cough for many years. His present attack of bronchitis began two months after the gassing. He is evidently a case of chronic bronchitis of long duration.

No. 40.—Man gassed in December, 1915. He is uncertain whether it was shell or cloud gas, but it had a "pleasant smell." It made his eyes water and caused severe coughing. He felt "intoxicated" and became unconscious, remaining in this condition for about two hours. He vomited freely in the dressing station. He returned to duty after six days. He has always been subject to asthma and bronchitis, but since being gassed he has been very short-winded. His medical officer has no doubt that he exaggerated the story of the gassing, as he makes the most of all his ailments. His present attack of bronchitis does not appear to have been connected with the gassing. A second examination of blood, a month after the first, resulted as follows: Polymorphs, 57·5; lymphocytes, 33·5.

No. 36.—Man gassed with shell gas on August 21st, 1916. He vomited, but did not become unconscious. He complains of having a large amount of spit every morning; also of tight feeling in chest and pain in left side. He looks very well and nothing can be made out on examination. The film, which was sent from a distance, was bad. No great reliance can, therefore, be placed on the result, but as the man has returned to duty the case is obviously a slight one. The medical officer of the convalescent home regarded the man as making the most of his condition.

It will be seen that of the above-mentioned cases three are much less-marked cases of gas poisoning than the story of the patient would indicate, all having returned to duty within three months of the gassing. Other two are cases of chronic bronchitis which happened to be gassed, but a considerable interval elapsed between the gassing and "going sick." No. 29, the only remaining one of the series, is

apparently a clear case of pretty severe gas poisoning without marked blood change. A complication in this case, however, is a skin condition—psoriasis.

Grouping of Cases according to Chief Symptoms.

The remaining cases may be classified into groups according to the nature of the chief symptoms. The larger proportion show at some period more or less marked symptoms associated with the respiratory passages. In another series of cases the symptoms are mainly gastric. Not infrequently both types are to be met with together. Still another series is those in which nervous symptoms predominate.

In a small group of two cases, Nos. 3 and 6, gassed at the same time (September, 1915, British gas) the chief symptom was obstinate conjunctivitis. This was associated with tremors. It is possible that the nature of the gas has something to do with the peculiarity of the symptoms. It is a striking evidence of the profound effect which gassing has upon the tissues of the body that a year after the gassing the conjunctiva should exhibit such marked inflammatory change.

Nervous phenomena are exhibited by a large number of cases sometimes in the form of what may be called neurasthenia, as in Nos. 15 and 27. Headache is severe and persistent in some—e.g., Nos. 15 and 32. Tremors were present in Cases 3, 4, and 6.

Gastric symptoms are among the most obstinate in some cases. Two of these, Nos. 13 and 15, are worth recording as they are associated with a high leucocyte count.

No. 13.—Gassed (British) in September, 1915. He lost consciousness some hours afterwards, and remained unconscious for four days. For several days afterwards he suffered from intense nausea and vomiting, and these persist in some degree up to the present time. He was sent home, and after a month returned to the Front, and remained there from November, 1915, till July, 1916. He remained fairly well until May, when he began to suffer from pains, particularly in the shoulder and chest, like a knife going through him. He was again sent home, and has been twice in Craigleith Hospital, with intervals at convalescent homes. He has constant nausea and disinclination for food and occasionally vomits. The pains in the chest and limbs also persist to the present time. His blood shows a persistent moderate leucocytosis (15,000). His differential count on last examination was: polymorphs 44, lymphocytes 46. There is thus an absolute increase in the polymorphs as well as in the lymphocytes, although it is more marked in the case of the lymphocytes. (See Table II.)

No. 15 is a very similar case who was gassed on two separate occasions—once (on July 30th, 1916) slightly, owing to sleeping through a gas attack in his dug-out; on another occasion (August 3rd) while trying to extricate an officer from his dug-out after the explosion of a shell. On the latter occasion he was rendered unconscious. His case is complicated by neurasthenia following shell shock. He suffers from persistent pains in the head and dyspepsia with frequent vomiting. His blood shows a moderate leucocytosis, 17,000. His differential count on the first occasion was: polymorphs 36·2, lymphocytes 55·4; on the second occasion, three months later, 37·3 and 58·3 respectively. The man is still in hospital and shows little sign of improvement.

The question arises as to what the leucocytosis is due to in these cases. Gastritis is undoubtedly the most prominent symptom, and it is reasonable to suppose that subacute inflammation of the gastric mucous membrane might account for it. The interesting point is that the lymphocytes are more markedly stimulated than the polymorphs.

Cases with respiratory symptoms.—The cases with marked and persistent respiratory symptoms are most numerous. The common complaints are pain in the chest, cough, and breathlessness. Such cases are Nos. 9, 25, 26, 31, 33, 37, 39, and 41.

No. 9.—Gassed (British) October, 1915. He was exposed for 20 minutes, but only complained of feeling dazed. He suffered from cough for three months, and in September, 1916, complained chiefly of breathlessness. On auscultation crepitations could be heard in both lungs. His was the case which first drew attention to the blood alteration. His count, confirmed on several occasions, was: polymorphs 39 per cent., lymphocytes 51 per cent. His leucocyte count was 6562 per c.mm.

No. 31.—Gassed on July 25th, 1916 (shell). He was partly buried by the explosion and stunned. He had breathlessness from the first, also vomiting. He was conscious at the time of a sweet, rather pleasant odour. At the time of examination (Oct. 20th) he had a slight cough and somewhat copious catarrhal expectoration. He had a scorbutic skin condition. The percentage of polymorphs and lymphocytes was the same—viz., 49·4.

No. 37.—Gassed on Sept. 25th, 1915 (British, burst cylinder). He was rendered unconscious by the shell which burst the cylinder, so that he had a good dose of the gas. When he recovered consciousness he started coughing and vomiting. He complains (Oct. 16th, 1916) of pain in the right side of chest. He is troubled with wheezing and coughing. His medical man, not being able to make out much in the way of physical signs, regards the man as a humbug. His count is: polymorphs 37·8 per cent., lymphocytes 54·8 per cent.

No. 39.—Gassed on Oct. 15th, 1916 (shell). He noticed a sweetish odour which caught his breath. He was unconscious for four hours. Oxygen was administered for four days. His most prominent symptoms are breathlessness, pain and tightness in the chest, and giddiness. He complains also of impaired digestion. His count was: polymorphs 44 per cent., lymphocytes 54·3 per cent. His leucocytes numbered 11,562.

No. 41.—Gassed May, 1916 (shell). He did not feel much at the time. A few days afterwards he developed cough and breathlessness. He is still suffering from bronchitis. His count is: polymorphs 50 per cent., lymphocytes 45 per cent.

Type of Lymphocytosis.—Cause of Blood Change.

The type of leucocyte which is increased is the small lymphocyte with relatively large deeply staining nucleus and relatively little protoplasm. In a few cases there was a fair sprinkling of larger lymphocytes with a broader rim of protoplasm and a larger nucleus. No other type of blood cell appeared to be influenced in any constant fashion.

The last point which arises is the question of the cause of the blood change. A relative or absolute lymphocytosis is met with as an accompaniment of a large number of pathological conditions. Of the list mentioned in Gulland and Goodall only two—viz., chronic catarrh of the small intestine (relative lymphocytosis) and whooping-cough—seem to have any relation to conditions met with in gas poisoning. Undoubtedly gastric catarrh is a prominent symptom in a large proportion of these cases.

The blood change would appear to have no relation to the nature of the gas employed. Apparently, therefore, it is due to some change set up which is common to all types of gas poisoning. It may be that it is the chronic catarrh of respiratory or alimentary mucous membranes which explains it, but we are still in the early stages of our knowledge of the effects of gas poisoning on the body. They are undoubtedly very profound and persistent. No mention is made of any blood change in the official Memorandum on Gas Poisoning in Warfare, but that pamphlet deals only with the immediate effects of the various gases. We know, however, that catarrh of respiratory and gastric mucous membranes is present in the early stages and tends to persist. Lymphocytosis is met with in tuberculosis, syphilis, and other subacute and chronic infections. From analogy, therefore, one would judge that the chronic catarrh is a factor in the production of the change. In two cases with marked gastric symptoms there was a moderate leucocytosis with a persistent high lymphocyte count.

Recently I had the opportunity of examining the blood of an officer who was accidentally gassed in this country with chlorine. The accident happened on Jan. 24th, 1917, and the blood was examined on the 27th. The red cells numbered 5½ millions, the hæmoglobin was 98 per cent., and the white cells were 5,900 per c.mm. Beyond a slight leucopenia, there was therefore no change. The differential count was normal: polymorphs 68·5, and lymphocytes 25·5.

Little can be gathered from the examination of a single case, but what evidence there is goes to show that the gassing results in a destruction of leucocytes, but that at such an early stage there is no stimulation of any one type of leucocyte. The case was a very slight one, the patient returning to duty within a week of the gassing.

Summary and Conclusions.

1. In cases of gas poisoning in which symptoms persist, there is an increase in the number of lymphocytes, relative and absolute, in the circulating blood. In slight cases this may not be beyond the normal limits or in excess of what may be met with from other causes. In any marked case, however, the change is sufficiently striking to be of some importance in cases where the medical officer is in doubt as to the reliance to be placed upon the statements of men complaining of having been gassed.

2. The blood change is elicited by a differential count of the leucocytes, and it may be taken that a count in which the percentage of lymphocytes approaches that of the polymorphonuclear leucocytes, indicates that the patient is still suffering from the effects of the gassing—i.e., provided there is no other complicating disease present which might produce a similar change. A slight relative lymphocytosis is not an uncommon finding in men from overseas or in anyone, so that no great reliance can be placed upon the sign unless it is marked—i.e., unless the percentage of lymphocytes approaches closely that of the polymorphonuclear cells.

3. The cell which is increased is the ordinary small lymphocyte of the blood. There may be in some cases a diminution in the number of polymorphonuclear leucocytes which will, of course, accentuate the sign, but the increase of lymphocytes is an absolute one. Moreover, it appears in cases with a high leucocyte count.

4. The change is one which develops early, probably within a month of the gassing, and continues for a long time; in cases with persistent symptoms for at least 18 months.

5. The change appears to be independent of the kind of gas, and it is shown by patients exhibiting many varieties of symptoms.

6. It is not clear what the change is due to, but from analogy with other conditions exhibiting a lymphocytosis it is probable that chronic inflammatory change in respiratory and gastric mucous membranes is at least a factor.

Note.—Since writing the above I have had a further series of cases gassed during the early months of 1917. The same blood change is shown in marked degree. One of the cases after three months gives the following differential count: polymorphs 29·5, lymphocytes 66·6, mononuclears 2·0, eosinophils 1·9. These cases have shown more marked nervous phenomena—viz., sleeplessness and night terrors.

Edinburgh.

TRENCH FEVER.

IS THIS CONDITION A SPIROCHÆTOSIS?

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With a Note on the Technique of Wassermann Reaction by

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A CONSIDERABLE number of articles have recently appeared in the leading medical journals of the different countries at war on the subject of trench fever, together with theories as to its origin. A certain number of workers have discovered a spirochæte in the blood, and suggest that it is the source of infection. Riemer[1] has gone a step further and has succeeded in growing spirochætes by anaerobic blood culture, but he is in doubt as to whether he has discovered the cause of the disease.

A considerable number of trench fever cases have passed through my hands in the medical wards of the City of London Military Hospital, and it has been my custom to classify them as acute and chronic.

Acute cases do not arrive in this country until the acute symptoms have passed off. The patients give a history of the, now well known, characteristic symptoms of this disease—namely, a fever of 5 to 8 days' duration, of sudden onset, with or without shivering and acute pains in the lower limbs, particularly in the shafts of the tibiæ. On admission to hospital on arrival from abroad they show practically no symptoms, and do not complain of pain. In some cases, after a few days, generally 6 to 10 days after the temperature falls to normal, a relapse occurs which lasts 2 to 3 days with a return of pain in the limbs. Recovery is rapid and the patient may, or may not, have a second relapse. Should there be a second relapse, it is generally after an interval of about a fortnight, and the severity of the attack is much less than that of the first. In this way the disease dies out.

I have not investigated the origin of this type. The condition is relieved, if not cured, by the administration of salicylates, and the stay of the patient in hospital is of comparatively short duration.

Chronic cases.—A totally different state of affairs obtains in the second class of cases—namely, the chronic type. The patient is admitted convalescing from a recent attack of trench fever diagnosed in some cases as such, in others as P.U.O., and in others as myalgia. The last two terms cover a multitude of diseases found in men on active service, but the cases referred to in this article are only those in which the patients give a history of an attack of fever with the characteristic symptoms of trench fever. On admission the one symptom is pain in the shafts of the tibiæ with extreme tenderness in these regions. There is no evident thickening of the bone or periosteum and no sign of any skin involvement. The temperature ranges about the normal line, but is never above 100° F. When first these cases were admitted it was found that no medicine would relieve the condition except morphine, and the pains were frequently so severe as to necessitate its use. Salicylates and iodides gave no relief.

The condition resembled a syphilitic infection of the periosteum so closely that the question arose as to whether the Wassermann reaction was likely to be present. This was tested by Dr. Carnegie Dickson. (See below.) In the vast majority of cases he found that the Wassermann reaction was positive. The cases did not give a high index, but always a figure high enough for the reaction to be considered as positive. The patients' histories were carefully investigated, but in only 4 out of 63 cases could any history of syphilis be obtained. Possibly more could have given a positive history of syphilis, as soldiers, for obvious reasons, do not readily admit having had this complaint.

Intravenous injection of galyl was administered on the lines laid down for syphilitic cases—that is, injections of galyl followed in three days' time by intra-muscular injections of grey oil, once a week for ten weeks. As a result of treatment the patient's general condition distinctly improved, but the pains did not disappear with that rapidity for which one could have hoped. Many cases had a decided increase of pain during the night following the intravenous injections, and then for several days were comparatively comfortable. The very severe cases did not show any permanent improvement and were finally boarded out of the Army. During the course of treatment two of these developed very severe posterior nerve root pains, similar to those occurring in syphilitic conditions. However, more than half of the cases returned to duty with the Army. This may seem a small percentage of recoveries, but it should be pointed out that all the cases treated in the above manner were of a very severe type and had resisted all other forms of treatment. It is important to note that after a few intravenous injections the Wassermann test reacted negatively.

There is not the time at present to work out minutely the details of these cases, but is not the above additional evidence in favour of the spirochætal origin of the disease? We know that a positive reaction is found in other spirochætal diseases as well as syphilis, as in yaws, for example. Granted a spirochæte has been cultured from the blood of these patients, and the blood of a certain type of cases—namely, the long-standing ones—gives a positive Wassermann reaction, the natural deduction is that the disease is a spirochætosis.

As regards the acute type of the disease, it would be well worth while investigating the reaction, but it is possible that these cases are of too short duration to give a reaction.

It is recognised that the matter requires much more scientific study, and it is hoped that the above short notes in a few cases—about 60—may lead those who have the opportunity to make further investigations on these lines.

Note of Technique of Wassermann Reaction, by W. E. CARNEGIE DICKSON.

The technique employed in testing the Wassermann reactions in the foregoing cases was that elaborated by Professor Robert Muir, of Glasgow, somewhat extended, a series of 12 tubes being used for each case. In these the constants were the antigen (alcoholic extract of human heart, previously standardised), 0·1 c.c. slowly emulsified in 0·6 c.c. normal saline, and 0·05 c.c. patient's heated serum. The variant was fresh guinea-pig's serum from 0·01 to 0·3 c.c., the minimum hæmolytic dose of complement being separately estimated with each set of tests, so that the reaction could be calculated and stated in numbers of hæmolytic doses of complement. The hæmolytic system consisted of 1 c.c. 3 per cent. washed sheep's corpuscles sensitised with five times the M.H.D. of rabbit's H.I.B.

These cases were tested with my other routine cases along with the sera of known negative and syphilitic controls. The patient's sera were also tested alone without antigen, and the complement-deviating capacity of the antigen itself was also tested on each occasion. Five M.H.D.'s of complement was the usual "syphilitic margin" in these reactions, a strong positive serum running to 15, 20, 30, or more M.H.D.'s, and a negative either not absorbing any excess or only perhaps a half to one M.H.D. of complement.

[1] Münch. med. Woch., No. 3, 1917.

THE SURGICAL USES OF OZONE.

BY GEORGE STOKER, C.M.G., M.R.C.P. IREL., M.R.C.S.,
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IN THE LANCET of Oct. 21st, 1916, a tabulated statement was given of 20 cases treated by ozone at the Queen Alexandra Military Hospital. Further cases are now recorded in the accompanying table.

Instructions for using ozone.—1. The accumulator should not be let down below 3½ volts; if it is, the ozone (if any) produced will not be strong enough to produce satisfactory results. The accumulators should be tested daily with a voltmeter, *and should be recharged every second day.*

2. The coil should be examined daily to see if it is sparking properly and the binding screws of the "trembler" screwed up tight.

3. The production of ozone should be tested before each patient is treated. This is done by holding a piece of white blotting paper saturated with the test: Starch, 1·25 per cent.; pot. iod., 0·25 per cent.; water, 98·50 per cent.; before the nozzle of the ozone tube. A deep blue colour should be produced in two seconds.

4. After using the flexible tubes they should be carefully wiped and steeped in *boiling* water for two minutes and then placed in cold water till they are again required. Ozone should be passed through the tubes to cleanse them thoroughly inside.

5. Boiled water *only* should be used for dressing and cleansing the wounds, sinuses, &c. Solutions such as lysol, carbolic acid, saline, &c., destroy the ozone by offering a field for chemical action.

6. It is emphasised that ozone will disclose the presence of (*a*) dead bone; (*b*) foreign bodies; (*c*) septic deposits; and it is useless to suppose ozone can effect healing till these conditions have been dealt with by the surgeon. The sudden appearance of fœtid pus is indicative of the existence of one of these conditions, and ozone should be continued to purify the discharge before any surgical operative steps are taken.

7. The usual changes that take place in the discharges are as follows: (1) Increase of pus; (2) decrease and disappearance of pus, which (3) is replaced by clear serum, which (4) eventually becomes reddish in colour.

8. It is reasonable to allow one week of treatment for every month of previous duration without healing, before healing can be expected.

9. The length of time for which the ozone is to be used depends on the size of the surface to be treated. The maximum time is about 15 minutes.

Table of Further Cases of Wounds, Sinuses, and Cavities Treated by Ozone.

M, months; W, weeks; D, days; Ap, applications; U.T., still under treatment; N.R., no result; Dec. Tr., declined treatment; R, removed.

No.	Nature of disability.	Previous duration.	Duration of treatment.	Result.
21	Twice plated for fracture of femur. "Plate" acted as "foreign body."	—	—	N.R.
22	Wound on instep, bell-mouthed sinus extending from dorsum to sole foot, 3 in. deep.	8 m.	3 m.	Healed.
23	Sinus in stump 2 in. deep.	10 ,,	7 w.	,,
24	Abscess cavity 3 in. deep, opening 4 by 3 in.	10 ,,	3 m.	,,
25	Ulcer on front of leg, 1¼ in. long, 1 in. deep.	18 ,,	3 ,,	,,
26	X ray burn, ulcer 10 by 4 in.	12 ,,	—	—
27	Large surgical wound, 10 in. long, 2½ in. deep, with inner opening leading to cavity in bone 2½ in. deep.	15 ,,	3 m.	Healed.
28	Sinus on left side of lower jaw, 1½ in deep.	4 ,,	5 w.	,,
29	Sinus extending from horizontal ramus of lower jaw 4 in. long.	1 ,,	5 ,,	,,
30	Compound comminuted fracture of upper third of left femur, causing sinus 3 in. deep.	17 ,,	6 ,,	,,
31	Fracture of upper part of thigh, leaving sinus 2½ in. deep, opening into cavity in bone, ¾ by 1½ in.	13 ,,	3 ,,	,,
32	Large wound on right side of face, 3 by 4½ in. with deeper opening extending into mouth.	3 w.	1 m.	,,
33	Sinus and cavity in tibia 1½ in. deep.	10 m.	15 d.	,,
34	G.S.W. leaving sinus in front of thigh 2½ in. deep.	10 ,,	—	,,
35	Sinus from inner angle of stump. Sinus from middle of stump 2 in.	10 ,,	3 w.	,,
36	Sinus 3½ in. deep below point of shoulder.	14 m.	—	U.T.
37	Sinus passing through middle part of thigh penetrating femur.	14 ,,	3 w.	Healed.
38	Sinus at point of chin, 1½ in. deep.	1 ,,	8 d.	,,
39	G.S.W. L. thigh, operation for dead bone, leaving large surgical wound 4 by 4 in. One sinus in femur 1 in. in diameter, 1 sinus in soft tissues 1 in. in diameter, both 2 in. deep.	17 ,,	—	,,
40	Suppuration after enucleation of eye.	18 ,,	4 w.	,,
41	Sinus 3 in. long extending from outer angle of flap.	10 ,,	5 d.	,,
42	Suppuration of socket after enucleation of eye.	6 ,,	5 w.	,,
43	Sinus at inner aspect of stump 2 in. deep, running into a cavity 2 by 3 in.	23 ,,	12 ,,	,,
44	Compound comminuted fracture of forearm, incised wound with sinus leading down to ulna 1½ in. deep.	4 ,,	3 ,,	,,
45	Ulcer on left chin.	2 ,,	6 d.	,,
46	Surgical wound 10 by 4 in. for removing of plate from femur, with 2 sinuses.	1 y.	2 m.	,,
47	Suppuration in socket after removal of eye.	6 w.	4 d.	,,
48	Ulcer on cheek with actinomycosis.	4 m.	17 ,,	,,
49	G.S.W. detaching all structures from brim of pelvis, leaving large cavity 4½ in. deep, communicating with bladder.	16 m.	—	Conval.
50	G.S.W. r. leg, 3 sinuses 1½ in., ¾ and 1 in. in depth.	10 ,,	—	Healed.
51	Sinus in stump, 1½ in. deep.	11 ,,	12 d.	,,
52	Compound fracture of ulna, flexor tendons gangrenous, had to be cut away.	13 ,,	1 m.	,,
53	Suppurating cavity in groin, 1 by 2½ in.	2 ,,	1 m.	,,
54	Sinus in foot, 1½ in. deep.	2 ,,	9 d.	,,
55	Excision of elbow-joint, leaving sinus 1¼ in. deep.	12 ,,	—	,,
56	Sinus in stump 3½ in. deep.	23 ,,	9 d.	,,
57	Two sinuses in upper part of thigh, outer sinus 2½ in. deep, inner sinus 3½ in. deep.	12 ,,	—	,,
58	G.S.W. sinus inner side of arm, leading down to bone, 3½ in. deep.	2 y.	—	U.T.
59	G.S.W. r. arm, suppuration and sinus 1¼ in. deep.	14 m.	—	U.T.
60	Sinus in thigh 2½ in. deep.	9 ,,	6 w.	Healed.
61	Sinus in buttock 2½ in. deep, shell piece came away.	3 ,,	6 d.	,,
62	Sinus in left humerus 1 in. deep.	23 ,,	5 ,,	,,
63	Surface wound after operation, a bell-mouthed sinus through forearm.	12 ,,	24 ,,	,,
64	Wound from operation 1 by 3 in. and sinus down to humerus.	15 w.	6 w.	,,
65	Bell-mouthed sinus over left external malleolus.	13 m.	2 m.	,,
66	Empyema left side, profuse discharge of pus.	9 ,,	—	N.R.
67	Bell-mouthed sinus in forearm.	5 ,,	1 m.	Healed.
68	Deep furrow in tibia 1 by 3 in. leading down to cavity in bone.	22 ,,	—	U.T.
69	Suppuration in right lacrymal sac.	18 ,,	21 ap.	N.R.
70	G.S.W. penetrating wound through calf.	6 w.	17 d.	Healed.
71	Sinus and subcutaneous space right side of back of neck.	3 ,,	10 ap.	,,
72	Ulcer on external malleous (right).	7 m.	3 m.	,,
73	3 sinuses in left thigh.	14 w.	17 d.	2 out of 3 sinuses healed.
74	Empyema left side, profuse discharge, very fœtid. Cavity in lung.	2 m.	2 m.	Healed.
75	Two sinuses in right thigh: (1) 2½ in. deep; (2) 2 in deep.	2 y.	—	Dec. Tr.
76	Sinus through arm double bell-mouthed.	4 m.	—	N.R.
77	Sinus and cavity in lower jaw.	1 ,,	19 d.	Healed.
78	Sinus in stump 2½ in. deep.	5 ,,	—	R.
79	Sinus in os calcis (right) 1½ in. deep.	9 w.	9 d.	Healed.

Remarks.

Case 22.—Withdrawn from treatment for operation for 3 weeks.

Case 26.—Ulcer healed rapidly until half original size, when patient left hospital of own accord.

Case 31.—Ozone disclosed cavity in femur containing piece of shell ½ by ¼ in. which came out without operation.

Case 32.—Wound extremely unwholesome and fœtid but smell disappeared within 5 days of using ozone.

Case 36.—Ozone disclosed and X rays confirmed existence of several pieces of metal in and about sinus and on shoulder blade. Returned for operation.

Case 39.—Sinuses healed 1 month.

Case 41.—Examination showed streptococci before ozone. They completely disappeared after second application.

Case 44.—This case is awaiting plating of forearm.

Case 49.—Returned after operation Jan. 9th, operation Nov. 1st.

Case 50.—Ozone disclosed dead bone, which came away.

Case 55.—Transferred to Oxford at own request.

Case 58.—Returned after operation, Dec. 13th.

Case 59.—Returned after operation, Nov. 30th.

Case 67.—Transferred to Aldershot.

Case 69.—Returned for operation; lacrymal sac removed.

Case 72.—Returned for treatment after operation Dec. 18th.

Case 75.—Left of his own wish.

CRYSTALLO-CHEMICAL ANALYSIS AND ITS USE IN MEDICINE.

By T. V. BARKER,

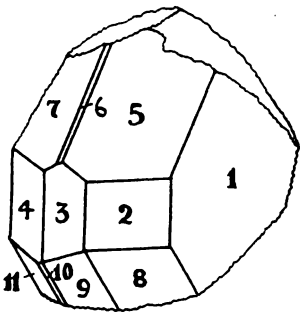
UNIVERSITY LECTURER IN CHEMICAL CRYSTALLOGRAPHY AND FELLOW OF BRASENOSE COLLEGE, OXFORD.

ON April 3rd I received a package from Dr. P. Govaerts (of the "Ambulance Océan," La Panne) containing a crystal of unknown composition and of intestinal origin, with the query: What is it? The crystal is shown in Fig. 1; it is seen to exhibit a moderately facetted development at the front end, the back portion being rounded. After an examination lasting 65 minutes it was possible to state that the crystal is "salol" (phenyl-salicylate). The correctness of this "diagnosis" was subsequently confirmed by a melting-point determination made on a tiny splinter weighing less than 0·0001 gramme (m.p. 43° C.), and by the specific optical properties of the resolidified fragment when examined under the polarising microscope.

Description of Crystallo-Chemical Analysis.

What was the method employed? A little reflection will negative the supposition that the substance had been subjected to chemical analysis. The crystal weighed (and still weighs) 0·229 gramme. The most expert chemist could scarcely hope to effect a complete analysis with this small amount of material. A little test-tubing might, it is true, have revealed the presence of a compound of salicylic acid; an organic combustion would have fixed the percentage of carbon and hydrogen, and so on. "Good luck," combined with a highly developed chemical instinct, might have been crowned with success. But suppose the crystal had been smaller; if its linear dimensions (9 × 7·5 × 4·5 mm.) had been one-tenth of what they happen to be, its weight would then have been of the order 0·0002 gramme. Any attempt at chemical analysis in such a case would be ridiculous. Identification, however, would have remained as sure as before, for the method adopted merely presupposes two conditions: first, that the crystal facets are smooth and light-reflecting; secondly, that the substance under investigation *happens* to have been previously examined by a competent crystallographer and its characteristic facial development put on record. Some 200,000 crystalline substances are known, of which about 10,000 have been properly investigated by the crystallographer; salol is one of the fortunate ten-thousand.

FIG. 1.



"Crystallo-chemical analysis"—the method of identifying well-crystallised products—we owe to the genius of Evgrav Stepanovich Fedorov, professor of crystallography in the School of Mines, Petrograd. Its immense possibilities are so obvious that the following brief description may be of interest to readers of THE LANCET.[1]

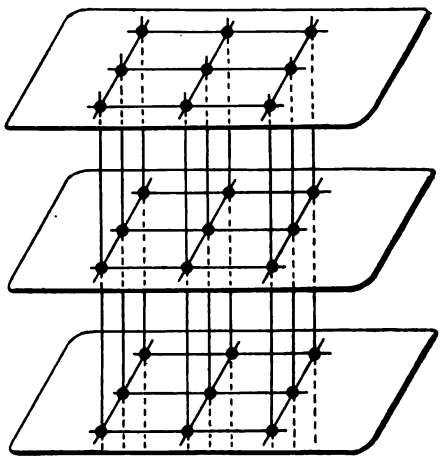
The specific nature of crystalline form was established a century ago. With the exception of a comparatively small number of substances which crystallise in the form of the cube or in forms having a simple relationship to the cube (crystals of the "cubic system"—common salt is an example), each definite chemical substance has its own *characteristic form*, whereby we mean that the plane faces are mutually inclined at specific angles. These angles can be measured in degrees and minutes by the help of the "goniometer." Measurement is especially rapid and exact with the latest form of instrument—the Fedorov theodolite goniometer. Thus, in salol—the angles between the pairs of faces numbered 1 and 5, 8 and 9 are respectively 60° 38′ and 13° 39′, and so on. The accurate measurement of a sufficient number of angles occupied half an hour. Twenty different angles were measured.

Now, suppose we assume that 20 angles have been measured on each of the 10,000 substances investigated by crystallographers, how are we going to sort out these 200,000 angles in the crystallographic literature in order to find a substance (if any) presenting that group of angular values which we have just obtained from the crystal under investigation? It is clear that any scheme of classification would be hopeless; there are too many variants to be classified, hampered as we are by a totally inadequate environment of space having merely three dimensions. If the number of variants (20) could be brought down to a respectable number, say three or five, the classification problem becomes feasible. Fedorov has devised a systematic and unambiguous method of reducing the number of variants. "Reducing" is not quite the right word; as we shall see later "integrating" is better.

Crystal Structure.

Crystal structure is a thing apart from all other structures; it is the very antithesis of "organised" structures associated with life. The latter macroscopically and microscopically reveal an intense differentiation of parts and functions. But the former reveals no such complexities, for all physical methods of exploration at our disposal (including, by the way, the recently discovered and very powerful X ray methods of research) converge to one conclusion—that down to molecular dimensions each part of a crystal is identical with, and similarly surrounded by, every other part. Let us draw on some sheets of paper two systems of equally spaced parallel lines so that they interlace at regularly recurring points or (alternatively let us potter about with some pieces of garden trellis-work) and arrange these sheets (or pieces of trellis) in parallel layers, taking care that successive sheets occupy similar positions—e.g., by drawing the upright system of lines included in Fig. 2. The points of intersection of the three sets of lines may be taken to represent the position of the structural particles (the lines are merely scaffolding—a figment of the imagination). Each crystalline substance has its characteristic array of particles, the chemical composition and constitution of the particle (molecule?) determining the exact arrangement. The arrangement typified by Fig. 2 is termed a "space-lattice." A glance at the figure is sufficient to show that it is nothing more or less than the spacial reduplication of a parallelepipedal cell, having particles at its corners. *Each crystal substance has a specific cell.*

FIG. 2.



Crystallisation is the union of free-to-move liquid or gaseous particles into a perfect, solid organisation. Crystal growth is a process of regular deposition from outside. Why such a growing crystal should take up a definite plane-polyhedral form, instead of forming rounded aggregates, is a question which invites speculation, but yields nothing profitable. In any case there is a simple mathematical relationship between the various faces on the most richly facetted crystal (the law of Haüy); there is an equally simple relationship between the external faces and the internal interlacing planes, or, in other words, between the faces and the form of the structural cell (the "law" or "principle" of Bravais). The nature of these laws need not be gone into. It will suffice to state that Fedorov deduces the

[1] For further information consult T. V. Barker, *Chemical News*, 1912, cvi., p. 199; Chemical Society's Annual Reports, 1913, x., p. 243; 1914, xi., p. 248; Times Russian Supplement, Feb. 26th, 1916, p. 11. I have in preparation a full treatise on the subject.

geometrical form of the cell from the facial development. All the faces are taken into account in this deduction. The process, then, is one of integration. The 20 (or more) angles on a crystal can now be rejected: *they are replaced by the angles of the cell.* These angles can be fairly easily classified in a book of three dimensions.

During the last ten years the whole of existing crystallographic literature has been brought under review by Fedorov and his work has been checked by his pupils, MM. Artemiev, Sokolov, and Barker. The chaotic mass of measurements and observations extending over a hundred years has been classified and incorporated into a one-volume "Index of the Crystal Kingdom," which will be published by the Petrograd Academy of Science. Proof-sheets of this monumental work are in my possession; without them the identification of salol could never have been effected.

Steps in the Process of Identification.

The steps involved in the identification of the salol crystal may now be briefly indicated. The measurement had occupied 30 minutes. The next five minutes were spent in plotting the results on a "stereographic map," which facilitates the study of the various angles (on this map the relative position of each crystal face is marked by angles of latitude and longitude originally read off from the goniometer). Twenty minutes were occupied in analysing the map, whereby three likely structural cells presented themselves as worthy of consideration. The following alternative lines of action were now possible: either to carry out certain graphical methods of calculation with a view to a final selection of that one of the three cells which satisfies most completely the Bravais principle, or to refer directly to the Index to see whether any of the three cells were included. The latter method was adopted as being easier. The third cell one had in view was, indeed, in the Index. On p. 691 there are no less than three substances having the cell in question—namely, salol, $HOC_6H_4CO_2C_6H_5$; potassium niobate, $K_{16}Nb_{14}O_{43}32H_2O$; and methyl di-isopropyl-sulphine hexachloroplatinate $[CH_3(C_3H_7)_2S]_2PtCl_6$.

We have evidently to probe the matter further. It need scarcely be stated that the intestinal origin of the crystal carried no weight in the decision as far as the writer is concerned. Integration of the crystal development had been extraordinarily effective; it had narrowed down the inquiry to three, crystallographically known, substances. But if there are three already known, why should there not be thirty unknown? In order to go further we have to abandon integration for differentiation; in other words, we have to go into details. The details are in the Index. On making a comparison of the list of faces developed on the three substances under consideration, there was a complete correspondence term for term with salol; not so with the remaining pair of substances. As a matter of fact, most crystalline substances enjoy little peculiarities. In salol the faces numbered 6, 9, 10 are not what one would expect to see developed from the standpoint of the Bravais principle: they are developed on all crystals grown in the laboratory; they were present on this crystal formed in the intestine. Again, the statement that there are three substances with identical cells is only true if we carry the angular measurements to an accuracy of ½° (30 minutes of arc), which is the limit of accuracy in graphical operations (unless they are carried out with such care as would involve a time better spent in exact trigonometrical calculations). The measurements of the crystal agree with those of "authentic" salol to a few minutes of arc. With regard to the more meticulous question whether the crystal is really some unknown (crystallographically, that is) substance, the reader may be assured that crystallographic experience is against this possibility. As has already been mentioned, confirmation of the truth of the purely crystallographic diagnosis was sought and obtained by a melting-point determination and by an examination of the optical properties, although such confirmation was hardly necessary.

The Future of Crystallography.

Although most precious results have frequently been obtained from the study of crystals (as witness, for example, Pasteur's capital discovery of the two forms of tartaric acid, the real basis of bio-chemistry), it must be admitted that the history of crystallography has not been a particularly happy one. Logically regarded, crystallography is a not unimportant branch of physical chemistry; it has, however, never been properly recognised by authorities, and consequently it has been doomed to a more or less precarious existence. The great development in recent years of the borderland between physics and chemistry must in any case gradually lead to a better appreciation of the "poetry of science," as crystallography has been so well termed; but the above account of one of its branches should make it clear that the science embraces a sphere of useful application in nearly all branches of knowledge, including those dealing with life-processes. How can this valuable adjunct be best turned to profit? It is obviously undesirable that a specialist in chemistry, physics, or medicine should attempt to become an expert in crystallography; if he is worth his salt his time is much better spent in exercising the arts towards which he has a personal inclination. He can, however, be of the utmost assistance to crystallography, and indirectly to his own subject, if he would only facilitate a more liberal recognition of its claims to be regarded as a worthy branch of inquiry. He can also be reasonably expected to coöperate in extending the usefulness of crystallo-chemical analysis. No substance can be identified unless it has been previously subjected to crystallographic investigation. It is evidently beyond the powers of the relatively small numbers of crystallographers to cope with substances as fast as they are turned out by synthetic chemists. Even if it were possible it would still be undesirable, inasmuch as the great majority of such compounds have their origin in a certain "superfluity of naughtiness" rather than in any real reasoning belief that the substance is likely to lead to the advancement of science and humanity; and the inclusion, in future editions of the Index, of a mass of *caput mortuum* would merely diminish its usefulness. It is therefore to be hoped that the chemist (in the wide sense of the term) will not take advantage of the ignorance of the enthusiastic crystallographer (who is, as a rule, only too willing to measure anything for the sheer love of æsthetics), but will confine his requests to such substances as are likely to have a direct influence on the development of science.

In conclusion, I wish to express my thanks to Sir William Osler and Professor W. H. Perkin for their genial interest.

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SPONTANEOUS RUPTURE OF THE SPLEEN.

WITH AN ACCOUNT OF A CASE DUE TO MALARIA AND ONE OF NECROTIC INFARCT WITH INTRAPERITONEAL HÆMORRHAGE SIMULATING SPONTANEOUS RUPTURE.

BY G. GREY TURNER, M.S. DURH., F.R.C.S. ENG.,
MAJOR, R.A.M.C. (T.F.).

AN experience of nine months' work in Mesopotamia has made me familiar with many complications of disease which may demand surgical interference. This has been especially so in the enteric infections and in those of the dysenteric group, but even in malaria the enlarged and softened spleen may give way, resulting in hæmorrhage into the peritoneal cavity, as pointed out in an annotation in THE LANCET of July 22nd, 1916. Although there were no symptoms in the first case to suggest surgical interference, it is easy to picture circumstances in which such interference might be necessary, as in the second case, which was, however, not strictly an example of spontaneous rupture. Incidentally, I should like to remark that both of the cases show the great importance of post-mortem examinations.

CASE 1.—*Spontaneous rupture of malarial spleen.*—Patient, seaman aged 35, an unusually big, strong man, admitted to British General Hospital at Basrah on June 17th, 1916. Ten days previously he had "reported sick" on account of pains in stomach, vomiting, and constipation, and had been treated with quinine for "fever." On admission he was a little anæmic and expression very anxious. Temperature 101·4° F., pulse 88, of very poor tension; tongue very much coated, and dry. Abdomen was flat, neither rigid nor tender; spleen easily felt below costal margin. Nothing abnormal discovered in chest. Malarial parasites found in blood; also mononuclear leucocytosis. On morning after admission temperature 102·4°, but no other change in condition; bowels had been well moved. By the evening he looked much worse, had vomited several times, and complained of difficulty in breathing, but there was nothing to suggest any abdominal development. On the 19th it was reported that during the night patient had become restless and delirious, and in early hours of morning had developed generalised convulsions, most marked in

arms and lower jaw, the teeth being constantly champed. Some cyanosis; pulse quick and feeble. Death occurred at 10 A.M. No response to quinine, either when given by the mouth or by intramuscular injection.

Post-mortem.—I made a necropsy five hours after death. Abdomen contained moderate amount of unclotted blood, fairly uniformly distributed over whole peritoneal cavity. In spleen pouch was a considerable amount of clot and a smaller quantity over right lobe of liver and in pelvis. The spleen itself was twice normal size, and on outer surface near upper pole were two small lacerations each about ¼ inch long and with pouting margins, as though produced by bursting of the structure. These punctiform ruptures were evidently the source of hæmorrhage, which was most abundant around spleen; no other cause could be found. There were no adhesions which might have been torn, thus giving rise to bleeding, and no signs of injury to overlying ribs or parietes such as might perhaps have been caused by patient falling out of bed, nor was there any evidence of embolism or thrombosis. The intestines did not show any of the lesions of typhoid or dysentery. Lungs congested, but no consolidation; heart and kidneys normal. The head was not examined.

In this case, so far as I was able to ascertain, there was no acute attack of abdominal pain, and though from the first the patient was obviously very ill, there was nothing to suggest any peritoneal lesion while the man was under my care.

Vomiting is quite common in malaria, and, I think, especially so in the type we met with in Basrah about that time. I certainly thought that he might be suffering from an enteric group infection, but that was more from a consideration of his general symptoms than from any local abdominal signs. I do not think that the accident of spleen rupture had much to do with the death of this patient, for his symptoms were exactly like many others in which a fatal malaria was of the cerebral type. Under ordinary circumstances spleen blood clots easily, and from my experience of hæmorrhage generally I was led to conclude that the blood coagulation-time is diminished under the climatic conditions prevailing during the hot weather in Mesopotamia. I believe that recovery without interference not infrequently occurs even in traumatic cases and would certainly have followed in this case had there been nothing else to account for death. I do not think that spontaneous rupture of the malarial spleen can be at all common, for though this disease was rife both at Basrah and Amarah beyond this case, in which it was proved, and one other in a Sepoy, in which it was suspected, the patient recovering, I have not come across another instance, nor have I heard of any in talking over the matter with my brother officers, though an enlarged and friable spleen was the commonest of the disclosures of the post-mortem room.

CASE 2.—*Enteric group infection with intraperitoneal hæmorrhage regarded as being due to spontaneous rupture of spleen and subsequently proved to be in association with infarction of that organ.*—Patient, aged 30, driver in R.F.A., admitted to British General Hospital at Amarah. I was asked to see him about 7.30 P.M., Sept. 6th, 1916, as a possible case of ruptured typhoid ulcer. The man had been very ill for five weeks with what was diagnosed as a fever of enteric group, and for previous two days temperature had been going up, attributed to a concomitant malaria. About noon of the day I saw him he first complained of abdominal pain and twice vomited, while his pulse became quick and feeble, but I could not elicit any history of a definite sudden onset. He had been given a dose of morphia, and as its effect passed off the pain recurred.

On subsequent inquiry I ascertained that this man was admitted to the hospital on August 12th with fever of 14 days' duration. He was very ill and was at once placed on "dangerous list." Temperature was of irregular type, as high as 102° F., and only occasionally touching normal. Pulse varied between 76 and 90; very poor in tension. Tongue dry and furred; bowels fairly regular. At that time spleen was not felt, but a little later its edge was detected two inches below costal margin. The blood, examined on several occasions, was always found negative for malaria; Widal test inconclusive. Patient continued in an unsatisfactory state and with irregular pyrexia, but little other change until Sept. 1st, when he complained of pain in left side of chest; patch of pneumonia found at left base. This did not appear to give him much additional distress, but temperature gradually rose, and on evening of Sept. 5th reached 103°, and on the 6th occurred the attack for which I operated.

When I first saw him the man looked exceedingly ill and was obviously in the later stages of some wasting disease. He was anæmic and slightly cyanosed and lay partly propped up in bed sweating profusely, with feeble pulse of 132 and temperature of 101°. He only made complaint of pain in abdomen, and especially in lower part. On examination I found belly a little distended; it did not move well on respiration and surface was blistered as result of hot applications. Some rigidity, but not marked, and mostly in the flanks and iliac regions. It was especially noticeable that, while splenic dullness was considerably increased, normal liver dullness was replaced by a resonant note and there was no dullness in flanks.

I could only agree with the diagnosis of probable rupture of a typhoid ulcer. Under local anæsthesia I made a small subumbilical incision in mid-line. As soon as peritoneum was opened free blood escaped and a piece of omentum that presented had some blood clot entangled in its meshes, but there was no gas. The lower ileum was free from any sign of ulceration or inflammation; mesenteric glands slightly enlarged. As there was no evidence of peritonitis or fat-necrosis I recognised that I was probably dealing with an example of spontaneous rupture of spleen. Patient was anæsthetised with ether and incision prolonged. Quite a large amount of free blood escaped, though not nearly so much as in most cases of traumatic rupture. On passing my hand up to splenic area I found a considerable amount of soft blood clot, and about the middle of its outer convex surface I felt what I took to be a rent about 1½ inches long, and running forwards towards anterior border. It was occupied by firm blood clot, and though evidently the source of hæmorrhage it was presumably not then bleeding. There were no adhesions. Nothing further was done beyond rapidly closing incision. Although patient was very ill, and caused Captain A. H. Haddon, who gave the anæsthetic, some anxiety, he really stood the operation quite well and became conscious during administration of subcutaneous infusion of saline.

At this stage I feel that I ought to explain why I did not expose the spleen or attempt to interfere with the rupture directly. The temptation to inspect the lesion was very strong, but patient was exceedingly ill and it would have necessitated either a prolongation of incision to epigastrium or a second independent incision below left costal margin. Having exposed the spleen, I would either have had to remove it or trust to suture or perhaps gauze-packing. Further, from previous experience I knew quite well that a moderate rupture of the spleen could be well trusted to take care of itself, measures having been taken to tide the patient over the catastrophe of the immediate blood loss, and I thought that the condition of the patient demanded these temporising methods. In the light of subsequent events I regret that I felt compelled to adopt this course, for I believe that the best interests of the patient would really have been served by running what then appeared the very much greater risk incurred in an effort to expose the spleen.

Films made from blood in peritoneum were examined for malaria, but the parasites were not found. Unfortunately no attempt was made to inoculate culture-media.

On the day after operation patient was fairly well and had almost completely recovered from the shock. Temperature 100° and pulse 122 and of better tension; there had been no vomiting. On Sept. 11th he had some loose motions, containing blood, and on the 12th the left leg was found to be swollen and œdematous; no albumin in urine and condition probably due to femoral thrombosis. By the 13th the tongue, which had been very dirty, was cleaning up; wound dressed and found healed; abdomen moved freely; no tenderness. On this day I noticed two hæmorrhagic patches on back of either hand about size of a sixpence; they appeared evidence of mild scurvy; gums absolutely healthy and no other confirmatory signs. Between the 13th and 21st condition varied considerably, and for some days he was very ill, with temperature between 100° and 101° and pulse about 110. I suspected a pelvic abscess, but this was not confirmed by rectal examination. On Sept. 16th he was exceptionally ill and temperature again suggested malaria, but plasmodium not found; he had several loose motions. In spite of negative blood examination he was given 15 grains of hydrochloride of quinine by intramuscular injection and next day seemed better, but improvement only evanescent. About this time dullness of left base increased, and I withdrew a small quantity of blood-stained fluid. Breathing gradually became more embarrassed, and I have no doubt that in later stages the fluid in left pleura increased very rapidly. About Sept. 29th he vomited; no complaint of abdominal pain; tongue clean and moist. A small subcutaneous hæmorrhage was noticed on left arm and for first time a thin red line along margins of gums. From this time progress was steadily downhill. Breathing became more and more rapid; some cyanosis. He took food badly, was delirious at night, and rapidly lost flesh. Death on Oct. 4th, just four weeks after operation.

Post-mortem.—I made a necropsy three and a half hours after death. Abdominal scar was stretched and of deep purple colour; when epidermis covering it was divided, deeper parts were found completely occupied by recent blood clot and without least evidence of union. Catgut sutures absorbed; no naked-eye evidence of sepsis.[1] The small intestine area and right side of abdomen presented appearances associated with aseptic absorption of free blood in peritoneum. Some soft shaggy vascularised adhesions were present over dome of liver and among coils of small intestines. Great omentum tucked up, or shrunken, so as to lie along lower border of colon. Both splenic flexure and fundus of stomach with left lobe of liver were adherent to one another and to parietes, obscuring splenic region. There was a collection of fluid in left extremity of lesser sac, and on separating adhesions to parietes, the latter was opened into, allowing about half a pint of very offensive, thin, pink-coloured fluid to escape. The cavity was the much diminished lesser sac, and in addition to the fluid there was some blood clot and the wall was covered by an attempt at granulation tissue. Right half of sac, including foramen of Winslow, obliterated. Spleen surrounded by small amount of same sort of fluid as occupied lesser sac. Organ very friable and presented two areas almost completely separated and recognised as necrotic infarcts. The larger area was a wedge-shaped mass of tissue, about 1½ inches in longest diameter (transverse to long axis of organ), and 1 inch in shorter. It lay so loosely attached to its bed that it fell out by its own weight when specimen was turned over. It was of a dirty yellow colour and had a ragged surface without any sign of repair, in fact it looked exactly what it represented—a mass of necrotic spleen tissue. The bed in which it had lain resembled the crater of a volcano, and was largely advanced towards repair, its surface being quite smooth as though

[1] This, I take it, was an example of "disunion," a phenomenon almost peculiar to scurvy. When the wound was dressed at the end of a week, it was found to be perfectly healed and on the sixteenth day it looked as though completely consolidated. Had it been in the ununited condition found post mortem, for any length of time before death, I should have expected it to have given way with prolapse of intestine. In addition to hæmorrhagic patches on back of hands and small hæmorrhage on left arm previously mentioned, there were also some petechiæ on skin of abdominal wall and on the limbs. In reflecting the structures from front of chest I also came across a small localised hæmorrhage in substance of pectoral muscle. Evidences of a mild type of scurvy were quite common in patients in the last stages of diseases like enteric and dysentery, in which feeding on sterilised foods for long periods had been necessary, and I always looked upon the condition as of similar origin to the scurvy rickets of young children (Barlow's disease).

covered by a layer of endothelium. The other infarct, at apex of spleen, was exactly similar though only half the size. Condition of splenic artery and vein was not carefully investigated. In left pleural cavity was about two pints of thin hæmorrhagic fluid, without any naked-eye evidence of infection. Anterior border of corresponding lung was loosely adherent to parietal pleura, while base was firmly glued to upper surface of diaphragm. On separating latter from the lung two large areas of purulent lymph were exposed, and there was a most offensive odour recalling that in gangrene of lung. Substance of lower lobe carnefied, but no real consolidation; infective process was limited to pleural surface, having evidently extended up through diaphragm. Right lung and pleural cavity normal. Little blood-stained fluid in pericardium; two hæmorrhagic areas on surface of heart. The organ itself was enlarged, principally due to increase in size of right side, which was crammed full of blood-clot. At extreme apex of right ventricle was a small mass of tissue about size of walnut, oval in shape and pinkish in colour, and entangled in bundles of heart muscle. Its central part was broken down into a little cavity containing creamy pus. No endocarditis, but heart muscle pale and flabby. Liver slightly nutmeg and fatty, but no infected areas, though tip of left lobe had formed part of wall of cavity containing infarct situated at upper pole of spleen. The lower four or five feet of ileum and greater part of colon were examined, but without discovering any trace of ulceration, recent or remote. Mesenteric glands only very moderately enlarged. No gross pathological changes in kidneys. Specimens of pus were examined from: (*a*) mass in right ventricle; (*b*) fluid around spleen; and (*c*) that in lesser sac. They all gave the coli reactions, probably indicating a general *Bacillus coli* infection.

I presume that in this case the course of events was thrombosis of some branches of the splenic vessels, followed by infarction, mild infection, and separation of the infarcted areas. It was probably when the latter process began that the hæmorrhage into the peritoneum occurred.

I am indebted to Colonel W. H. Starr for permission to use the notes of the first case, and to Lieutenant-Colonel J. R. Bond for a similar privilege with regard to the second, and to both for their interest and encouragement.

PRIMARY SUTURE AND UNION OF OPERATION WOUNDS OF THE URINARY BLADDER.

BY A. RALPH THOMPSON, CH.M. MANCH., F.R.C.S. ENG.,
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MUCH ingenuity has been exercised for some time now in devising more or less adequate schemes for dealing with an open suprapubic wound of the bladder. The wounds which result from operations of such a nature as suprapubic prostatectomy occur, of necessity, most frequently in middle-aged or old people. In those cases of suprapubic operation in which some apparatus is fitted in order to prevent the running of urine and chemical fluids over the adjacent parts the skin is very liable to become exposed to the dangers of sepsis and trauma. On the other hand, in those cases in which no such measures are adopted the constant wetting of the dressing and consequent evaporation are liable to give the patient cold and retard his recovery.

Owing to the constant care exercised by my dressers at Guy's Hospital during the past four years I have been enabled to perform a number of operations, such as suprapubic prostatectomy, removal of a vesical growth, and retrograde catheterism, with primary suture of the bladder wall and superficial tissues.

Primary union occurring in bladder wounds of an operative nature offers such tremendous advantages over other methods of dealing with bladder wounds, that I am inclined to think it should be aimed at more frequently than it is. Cases of enlarged prostate and growth of the bladder which demand operation are put off frequently, in my experience, by both patients and their medical attendants, because they dread the inconvenience, labour, trouble, and danger involved by an open wound of the bladder. If, then, this difficulty of the open wound in a bladder can be in a reasonable number of cases overcome, we may expect to see enlarged prostates more frequently removed, and growth of the bladder extirpated, not so much for the purpose of averting a distressing and painful death, as is too commonly the case at present, as for rendering life pleasant and happy.

Method.

The method adopted for securing primary union in the wound following upon a suprapubic vesical operation in my cases is as follows.

After the actual disease is removed, such as an enlarged prostate or a vesical growth, steps are taken to control and prevent hæmorrhage. This is frequently quite trifling in amount, but is occasionally severe. The bladder is filled with gauze sponges which are saturated with hot boracic lotion at a temperature of 120° F. After a little time the sponges are removed and liquor hamamelidis B.P. at a similar temperature is poured into the bladder and allowed to remain there. The quantity used is about 3 ounces. A coudé catheter is then inserted into the bladder viâ the urethra, especial care being now taken that the wound shall not be contaminated, the wound being covered with cyanide gauze. The point of the catheter is laid carefully in the bladder, about one-third up the vertical height of the bladder, and the position of the catheter at this level is carefully noted in its relations to the meatus for future use, as a catheter may slip even when tied apparently securely, and it is important that it should not do so unknown to the surgeon or his assistants. The bladder wound is then exposed, and sutures are applied as follows.

The two ends of the incision in the bladder are secured with Lane's forceps, and the edges slightly everted; fine catgut sutures are then placed through the muscle wall of the bladder, as close to the mucous membrane as possible, but not through it. Each suture is tied immediately after it is passed, but not cut until all are tied, as tension upon them helps to steady the bladder.

Some difficulty is usually experienced in inserting and securing the lower sutures, but this must be done as perfectly as possible. About six or seven sutures are thus inserted, tied, and cut. The sutured part is carefully palpated in order that any holes left by suturing may be discovered and closed. The fibrous and outer muscular coats of the bladder are now secured with thicker catgut sutures, inserted in the manner of Lembert, and carefully tied, especial care being taken, as before, with the lower part of the wound. The number of sutures is, as before, six or seven.

A small gauze wick is placed in the cave of Retzius, after this space has been carefully washed with boracic lotion. If the peritoneum has been retracted upwards it is brought back into its original position on the front of the bladder, or even "encouraged" down a little lower. I think it helps the incision in the bladder wall to heal more readily. The abdominal wall is then sewn up with two rows of catgut sutures, the deeper row being placed through the rectus and pyramidalis muscles and anterior layer of the rectal sheath on each side, and the more superficial row through the superficial fascia and skin. Care should be taken to place at least one superficial suture through the skin and subjacent tissue below the wick of gauze laid in the cave of Retzius, as the edges of skin are thus much more likely to unite when the gauze is removed than when the gauze has no suture below it. I believe this to be an important point. The usual gauze dressings are then applied and the catheter is secured in the urethra.

After-treatment of wound.—The patient is returned to bed and the after-treatment is begun at once. (I always now have a spinal anæsthetic given in these cases, so that any immediate treatment necessary is more easily performed than when the patient is unconscious.) The dresser of the case washes out the bladder with normal hot sodium citrate solution; this prevents any blood from clotting. The irrigation is done with the help of a special apparatus, which I always use for the irrigation of the bladder, and which consists of two funnels, each holding four ounces of fluid, connected by long indiarubber tubes to a Y glass tube which in turn is connected up with the catheter by a short length of rubber tubing. There is in connexion with the two long tubes a double spring clip, so arranged that pressure opens one indiarubber tube and at the same time closes the other, or *vice versâ;* and thus first the clear irrigating fluid only mixes in very small quantity with the fluid from the bladder; and, secondly, the amount of fluid from the bladder can be easily compared with the amount injected. Care is taken that only four ounces of fluid are introduced, and drawn off, at each irrigation. Between the intervals of irrigation the catheter is connected with a drainage-tube having as long a drop as possible. These irrigations are continued at gradually lengthening intervals until the washings are free from blood, which usually happens within three days. For the next two or three days boric acid lotion is substituted for the sodium citrate solution, which has done its work in preventing clotting of the blood in the bladder. The gauze wick is removed upon the second day. The catheter is removed at the end of a week or 10 days, and the patient allowed up at the end of 14 days without a catheter. The sutures are removed after 14 days.

Results.

The results of this method of treating operation wounds of the bladder are detailed in the accompanying table of 13 cases. Even where a small fistula formed, it was quite small and rapidly healed, and in the case which was, relatively speaking, a failure, I do not regret having attempted primary union, as the open wound healed up remarkably quickly—I fancy much more quickly than if primary union had not been attempted.

Summary of Cases of Primary Union after Operation upon Urinary Bladder.

Total number of cases ...	13	Partial success	2
Average age of patients...	58	Success	10
Failure...	1	Deaths...	0

These cases have been reported by me as, although they are too few to form general conclusions from, they do show that much of the trouble incident to an open bladder wound may be overcome by obtaining primary union. I do not at present attempt primary union in cases in which (1) there is marked cystitis, (2) there is considerable renal insufficiency, (3) bleeding cannot be sufficiently arrested at the time of operation, or (4) too much unavoidable damage to the bladder wall has been done.

The good result indicated in the table is due chiefly to the assiduous after-care of my dressers, who, however, realise that, after the first two or three days, there is infinitely less trouble involved than when the wound is left open. Moreover, one is greatly assisted in these cases by the temporary partial suppression of renal activity which takes place, as I think, immediately after a major operation upon the bladder, and which may last for as long as 24 hours. If, however, the success of these operations, as indicated below, is in future practice justified, then it may be said that bladder surgery has advanced a considerable step forward, and been robbed of half its terrors.

Group I., Stricture of Urethra.

CASE 1.—Male, 67. ? Enlarged prostate. (Dr. L. G. Reynolds, Balham.) Suprapubic cystotomy. General anæsthetic. Primary suture of bladder and abdominal wall. Primary union. Discharged well from hospital three weeks after operation. Cystoscoped five weeks after operation. Greyish-white slough seen at fundus of bladder. Small urinary fistula formed, which healed up in ten days' time. Partial success.

CASE 2.—Male, 41. Impassable stricture. (Sir A. Fripp.) Suprapubic cystotomy. Retrograde catheterism. Internal urethrotomy. General anæsthetic. Primary suture of bladder and abdominal wall. Discharged within four weeks of operation. Union perfect. No. 14 English catheter is being passed without difficulty. Success.

Group II., Suprapubic Exploration of Bladder.

CASE 1.—Male, 35. ? Vesical neoplasm; none found. Suprapubic cystotomy. Primary suture and union of wound. Deep part of wound closed firmly. Slight retraction of skin edges. Delayed union of skin, but no urinary fistula. Partial success.

Group III., Growth of Bladder.

CASE 1.—Male, 37. Papilloma of bladder. Suprapubic cystotomy. Removal of growth. Primary suture and union. Discharged well at end of third week from operation. Success.

CASE 2.—Male, 69. Large papilloma at base of bladder. (Sir A. Fripp.) Suprapubic cystotomy. Removal of growth. Diathermy of base of bladder by Dr. C. E. Iredell. Primary suture and union of wound. Hæmatoma formed in perineum; this in part broke down, and small, quite temporary, perineal sinus formed. Success.

CASE 3.—Male, 57. Papilloma of bladder. Suprapubic cystotomy. Spinal anæsthesia. Removal of growth. Much bleeding and clotting of blood. Bladder wound reopened and left open eighth day. Recovery. Failure.

Group IV., Uncomplicated Enlarged Prostate.

CASE 1.—Male, 56. (Major Wallace Kemp, R.A.M.C. T., Kensington.) Enlarged prostate. Suprapubic cystotomy; general anæsthetic. Removal of prostate. Primary suture and union. No complications. Success.

CASE 2.—Male, 70. Very much enlarged prostate. Suprapubic cystotomy. Spinal anæsthetic. Removal of prostate. Primary suture and union. No complications except slight orchitis. Success.

CASE 3.—Male, 65. Enlarged prostate. Suprapubic cystotomy. Spinal anæsthetic. Removal of prostate. Primary suture and union. No complications. Success.

CASE 4.—Male, 64. (Mr. H. J. B. Cane, Belvedere.) Enlarged prostate. Suprapubic cystotomy; spinal anæsthetic. Removal of prostate. Primary suture and union. No complications. Success.

CASE 5.—Male, 65. (Mr. H. Cardin, Ingatestone.) Enlarged prostate. Suprapubic cystotomy; spinal anæsthetic. Removal of prostate. Primary suture and union. No complications. Success.

CASE 6.—Male, 66. (Dr. J. Steed, Staunton.) Patient very fat man. Enlarged prostate. Suprapubic cystotomy; spinal anæsthesia. Removal of prostate. Primary suture and union. No complications. Success.

Group V., Enlarged Prostate with Vesical Calculus.

CASE 1.—Male, 64. (Mr. Cane, Belvedere.) Enlarged prostate. Suprapubic cystotomy; spinal anæsthetic. Removal of prostate and three large stones. Primary suture and union. No complications. Success.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF SYPHILITIC PERIPHERAL NEURITIS.

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TEMPORARY SURGEON, ROYAL NAVY.

THE following case is of some interest as far as the accurate diagnosis is concerned.

The patient, a signalman, aged 25, in H.M.S.——, in the Eastern Mediterranean Squadron, joined this ship on July 21st, 1916, from Malta. Six days later I saw him, and he gave me the following history. He had had primary and secondary syphilis in March, 1916, having been infected at Malta, and had been treated in Bighi Hospital, Malta, with two injections of galyl, one in April and the other in May. He had no mercury, but thought that he had had potassium iodide for a few days. He was examined generally on July 27th, and no signs of syphilis were found. Mercury in the form of cream (1½ gr.) was injected into the buttock and this treatment was continued weekly until Oct. 12th. Only eight days after the first injection (August 4th) the patient complained of weakness in the right arm and hand. On examination a typical right main-en-griffe was found; the right hypothenar eminence was definitely wasted and there was cutaneous anæsthesia over areas corresponding to part of the distribution of the sixth and eighth cervical and first dorsal nerves to the right forearm and hand. Massage and passive movements were ordered to be applied to the right arm daily and he was given light duty. A few terra-cotta spots were found on the trunk; these were not very definite and nothing further developed in that region. No salivation, diarrhœa, or vomiting was present. No sign or history of alcoholism or injury could be found, and as regards the former the man had not been ashore, so was exceedingly unlikely to have had excess of alcohol. No swelling in the neck or axilla could be detected; there was no blue line on the gums or other sign of plumbism; no history suggested diphtheria, influenza, tubercle, enteric, or malaria, nor was dengue, Malta fever, beri-beri, or leprosy apparent. On August 7th and 8th the patient was further examined and besides the signs found on the 4th the following details were noted: Weakness of the extensors of the right wrist; anæsthesia over the right forearm and hand, analgesia being the most extensive (see Figs. 1 and 2); touch and temperature not lost

FIG. 1.

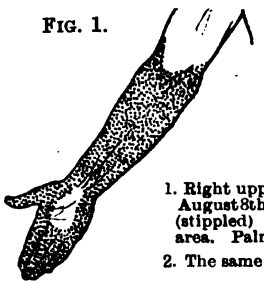
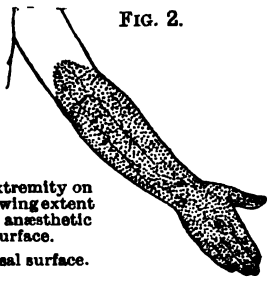


FIG. 2.

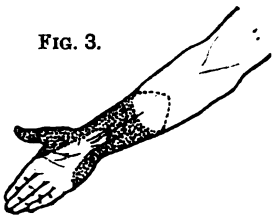


1. Right upper extremity on August 8th, showing extent (stippled) of anæsthetic area. Palmar surface.
2. The same: dorsal surface.

quite so extensively; relative hot and cold sensation unimpaired over rest of arm; circumference of right forearm a quarter of an inch smaller than left at its largest diameter, half an inch smaller at the middle. (The patient is right-handed.) The right supinator jerk was absent; the left present Both knee-jerks were present and the rest of the central nervous system was normal. No spinal disease could be detected. The patient complained of pain, and there was a discharge from the right ear; acute otitis media was found on that side. He stated that he had had recurrent similar attacks in the same ear throughout his life. Examination of the urine showed it to be neutral; specific gravity 1014; no albumin or sugar. On August 19th the membrana tympani of the right ear had healed completely after treatment locally by syringing with izal, ½ drachm to the pint, and the application of boric powder. Power in the right hand was slightly better. On the 22nd a note was made that sensation was improving. 31st: Sensation over ulnar and median nerve distribution improving. Sensation remained impaired over the dorsal area supplied by the radial (see Fig. 3). Sept. 21st: Analgesia

remained only over the radial nerve distribution; some wasting of forearm still apparent. Oct. 6th: Sensation had become normal and the muscles were improving. From Oct. 12th to Nov. 16th injections of mercury were discontinued. On Oct. 19th the right arm was practically normal and massage was discontinued. The patient was able to write perfectly well. Since then he has not had any trouble with the right arm. Injections of mercury were restarted on Nov. 16th and given weekly until Dec. 22nd. Now he is having fortnightly injections. Owing to the movements of the ship no Wassermann reactions were obtainable.

FIG. 3.



Right upper extremity on August 31st, showing diminution in extent (stippled) of anæsthetic area. Palmar surface. The dotted line indicates the upper limit on the dorsal surface.

From these observations there does not appear to me to be any doubt that the cause was syphilis; the only question about the diagnosis is whether there was peripheral neuritis due to syphilis or whether the lesion was situated anywhere else. The fact that complete recovery ensued upon mercuric treatment appears to confirm the impression that the lesion was in the peripheral nerves. The absence of pain makes pachymeningitis improbable, but this is also unusual in syphilitic neuritis. Hyperæsthesia was never present, which is unusual for neuritis of this origin. Presumably no central nerve cell lesion was present, as complete recovery would not then have occurred. The anæsthetic areas did not correspond accurately to any definite nerve roots, but nearly to peripheral nerve distributions; the palmar cutaneous branch of the median was apparently never affected.

A CASE OF FULMINATING MENINGOCOCCUS SEPTICÆMIA.

BY FREDERICK C. PYBUS, M.S.DURH., F.R.C.S. ENG.,
SURGEON TO THE HOSPITAL FOR SICK CHILDREN AND ASSISTANT SURGEON TO THE ROYAL VICTORIA INFIRMARY, NEWCASTLE-ON-TYNE.

IT would appear from the following case that death within 13 hours from meningococcal septicæmia is a calamity against which therapeutic agencies seem futile.

The patient, a girl aged 3 years, admitted to hospital as an abdominal emergency case and as such seen by me, was apparently in good health when, at about 11 A.M. on Dec. 19th, 1916, she was seized with abdominal pain and vomiting. The pain was sufficiently severe to make her cry out. The bowels were opened normally at about 2 P.M.

On admission to the Royal Victoria Infirmary, Newcastle, at 6 P.M., the child appeared very ill. Temperature 97·4° F.; pulse almost uncountable. She was slightly cyanosed and complained of abdominal pain. The house surgeon reported the case to me at about 8 P.M., stating that the child was gravely ill, that he thought he could feel a mass in the right hypochondrium, and although no blood had been passed he thought it might be a case of intussusception. I thought for a child to be so ill in such a time a massive internal strangulation would be a more probable diagnosis. I saw the patient at 9 P.M. and found her unconscious. The skin was burning hot and the temperature was found to be 103°, the pulse being uncountable. Cyanosis was present and the pupils were dilated. The abdomen presented no abnormal signs, except that the liver edge was readily palpable. On further examination petechiæ and small hæmorrhagic patches were found on the lower extremities. No signs of meningitis were present. I considered the case to be one of intense septicæmia, probably due to the meningococcus. The patient died three hours later.

Owing to the absence of Professor Stuart McDonald, the post-mortem examination was made by Mr. H. M. Johnston, the resident medical officer, and myself. The brain and spinal cord presented no signs of meningitis. The chest organs were normal. The abdominal organs were normal, with the exception that the liver appeared to be abnormally red in colour and that petechiæ were visible in the mucous membrane of the stomach and intestines. Cultures were made from the ventricular cerebro-spinal fluid and from the heart blood. The culture from the former was contaminated, but the heart blood gave a pure culture of the meningococcus.

Newcastle-on-Tyne.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ELECTRO-THERAPEUTICS.

Dosage in Radium-therapy.

A MEETING of this section was held on May 18th, under the presidency of Dr. G. HARRISON ORTON.

Dr. J. C. MOTTRAM and Mr. SIDNEY RUSS contributed a paper on "A Study in Dosage in Radium Therapy."

The patient, a woman, aged 56, was the subject of carcinoma of the breast, very slow-growing, with a large number of subcutaneous nodules on both sides of the trunk, a total of 80, which made it possible for some to be treated in various ways, while others were left as controls. The primary growth in the breast was near the nipple, in the superficial tissues. The primary growth was treated with X rays, but without benefit; the skin over the growth ulcerated, involving the nipple. The ulcer became covered with a dry crust, in which condition it remained until the present treatment by radium was commenced. Three mgm. of radium were applied over an area of 45 sq. cm., screened through 1 mm. of lead and two layers of lint. Shortly after its removal a transient erythema was noticed, and subsequently the crust covering the ulcer fell off, showing the skin beneath healed. The carcinomatous mass had not disappeared, and that was the present condition of the growth. Some of the nodules which had been under experimental treatment disappeared. There had been no glandular involvement nor metastasis in other organs.

This condition, called by some "disseminated scirrhus," was supposed to spread by the lymphatics. The changes in the skin observed formed a progressive series. The earliest change was an erythema, which occurred in almost every case. In many cases a slight scaliness was seen, but the radium produced no other change. In a few nodules there was transient œdema, and in some the application was followed by erythema and pigmentation, the latter persisting for months. The effect of radium on the nodules varied from complete disappearance to no appreciable change. In some there was caused a stoppage of growth, either temporary or permanent. It was not possible to measure the nodules from week to week, owing to their varying depth; the only criterion which could be employed was the time at which a nodule disappeared. The two main aspects of a study of dosage in radium were those on surface condition and the effects on subcutaneous nodules and the skin covering them. A question which the observers set out to answer was: Supposing the skin were made to absorb the same amount of beta ray energy as gamma ray energy, were the biological effects equal? To answer that they adjusted the radiation so that the first millimetre of skin absorbed as much beta energy as it absorbed gamma energy. This meant a pouring on to the skin of a large quantity of gamma energy owing to its absorption being so much less. As tissue became penetrated beta energy fell off very rapidly, so that at about a centimetre depth the available energy was only 1 per cent. to 2 per cent. of the original intensity. The gamma energy at that depth was about ten times as much; these rays also produced more profound changes in the skin than did the beta rays. The series of symptoms observed with varying doses of both kinds of irradiation, and embodied in a table, included erythema, scaliness, pigmentation, exudate, &c. These observations were all made with a dose of 7 mgm. When the dose was much diminished—namely, to 1/80th—and the time of application correspondingly increased, some of the more definite changes previously noted did not occur: only erythema and scaliness, sometimes pigmentation, but not exudate, and the disappearance of the nodule. A sequential study concerned the effects observed through various screenings.

SECTION OF OTOLOGY.

Cases and Specimens.—Diseases of the Ear and Recruiting.

A MEETING of this section was held on May 18th, under the presidency of Mr. H. J. MARRIAGE.

Dr. DAN MCKENZIE gave an account of 250 specimens of temporal bone which had been handed to him by Mr. A. L. Whitehead, of Leeds, and which he had examined in order to obtain measurements of the Fallopian canal. The results he presented in tabular form, arranged according to the age and sex of the patients. He obtained from the specimens

some thirty interesting facts. 35 per cent. of the bones were, clinically, of the infantile type. The information thus obtained had an important bearing on the performance of the radical mastoid operation. 50 per cent. of the specimens from people over 50 years of age showed dehiscence, probably due to the osteoporosis which occurred with advancing years.

Mr. J. F. O'MALLEY showed a remarkable case of cerebro-spinal fluid escaping from the ear during a period of 12 months. The patient, a man aged 27, had a mastoid operation performed 10½ years ago. After six years a polypus formed and was removed. During the ensuing two years polypi were removed twice, and again 18 months ago. Soon after the last of these operations the ear began to drip, and was worse at night. When Mr. O'Malley saw the patient the right external meatus, from which the dripping took place, was blocked by a smooth cyst-like swelling. This was found to be the scar-tissue lining of the mastoid cavity, raised by the cerebro-spinal fluid from the bony facial ridge and antral cavity. He reopened the mastoid and cleared out the old scar-tissue, but he could not localise the bony defect. As the dressings were still soaked all of them were removed, when the operation cavity was found to be bathed in pus. Despite careful treatment, the cerebro-spinal fluid continued to soak through the dressings for six weeks. The cavity, however, was now more free from pus, and he dusted daily with boric powder and packed firmly with sterile gauze. The point of escape of the fluid was found to be the posterior part of the attic. Even as late as 3½ months from the operation 1½ dr. of fluid collected in four hours. The patient must have lost about 1½ gallons of the fluid in 3 months.

Mr. C. E. WEST, Mr. SYDNEY SCOTT, Mr. R. LAKE, Mr. H. J. BANKS DAVIS, and Dr. KELSON discussed the case.

Mr. SCOTT showed a case of Squamous-celled Carcinoma of the External Auditory Meatus and Tympanum in a woman aged 22.

Captain G. J. JENKINS opened a discussion on the subject of Diseases of the Ear in Relation to Recruiting, which was deferred to the next meeting of the section.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.

Hallucinations in the Sane.

THE usual quarterly meeting of the association was held at the rooms of the Medical Society of London on May 15th. Lieutenant-Colonel D. G. THOMSON, R.A.M.C., presiding, made sympathetic reference to the decease of the following members: Dr. R. B. Smyth, Dr. T. Seymour Tuke, Dr. William Rawes, Dr. J. W. A. Murdoch, Captain G. Swinnerton Blandy, R.A.M.C., M.C.

Dr. ROBERT HUNTER STEEN read a paper on Hallucinations in the Sane, dividing his subject into (*a*) hallucinations the result of agencies operating upon the brain or nerves, and (*b*) those of mental origin. Among the former he placed toxins, both exogenous and endogenous, disorders of brain circulation, disease of end-organs, after images, and brain diseases of obscure pathology, such as epilepsy and migraine, and in the second category he placed cases in which, so far as present knowledge goes, a physical agency was unknown, including suggestion, hypnotism, crystal-gazing, clairvoyance, hysteria, somnambulism, multiple personality, hypnagogic visions, dreams, hallucinations in history, collective hallucinations, so-called telepathy, and hallucinations the result of a complex. Among the drugs which may produce this effect he included alcohol, absinthe, ether, stramonium, belladonna, hyoscyamus, nitrous oxide, chloroform, mercury, lead, and santonin. In the author's view hallucinations did occur in the sane, and cases met with in the sane should be intensively studied. This study was especially necessary in borderland or hysterical cases, and there seemed to him no reason to think that hallucinations in the sane differed from those in the insane, and each could be produced by toxins. He therefore thought it probable that hallucinations in the insane could be better studied from the psychological rather than the physiological standpoint. In every case presenting hallucinations he considered that some process of dissociation was at work, and this was supported by the fact that hallucinations were met with in cases of multiple personality.

Dr. C. A. MERCIER sent a contribution to the discussion, and the subject was further debated by Sir GEORGE SAVAGE, Dr. E. S. PASMORE, Dr. CARSWELL, and the PRESIDENT, and Dr. STEEN replied.

Reviews and Notices of Books.

Health and Empire. By FRANCIS FREMANTLE, F.R.C.P., F.R.C.S., Lieut.-Colonel, R.A.M.C. (T.F.). Second edition. London: Heath Cranton, Limited. 1917. Pp. 369. 5*s.* net.—In 1903 Colonel Fremantle took advantage of prolonged leave from official duties and made an extensive tour of the world. Starting by acting for a winter as a plague medical officer in Lahore and Amritsar, he visited other parts of India, Burma, Singapore and Malay, Cochin-China, Hong-Kong, Canton, and Shanghai, reaching Japan shortly after the outbreak of war between that country and Russia. After a short experience of war in Northern China he turned eastwards to San Francisco, went up to Vancouver, passed through Winnipeg, Chicago, and St. Louis, leaving the second winter free for visits to Paris, Geneva, Berlin, and Hamburg. Throughout his travels he was engaged upon a personal investigation of public health conditions of the world under various climates and rules, and he summed up his experiences in an interesting and valuable book which was reviewed in THE LANCET some six years ago. In this book his special aim was to persuade the public of the significance of public health problems as modified by various races and systems of government under which they arise, and his suggestion to form a permanent Advisory Council in London of experienced health officers, one from each of the Dominion Governments, is worth recalling at the present time, when the centralisation of public health administration is occupying so much attention.

Serving now with the Army in Salonica, Egypt, and Mesopotamia, he has found that the book will be very pertinent to the times that must succeed the war, and in a second edition, practically unaltered, repeats his urgent message that the future of our Empire must rest not on treaties and tariffs, armies and fleets, so much as on organised defence against disease. In the preface to the second edition he writes from Mesopotamia, quite in ignorance how apposite the words would be: "In civil government, while each department may have its medical adviser and him essentially a preventer of disease, so must there be one health department, call it what you will, to direct all the medical and sanitary services of the country and to be generally responsible for the health of the nation." Medical opinion is now solidly of this belief, and Colonel Fremantle's informing book will supply lay readers with unanswerable evidence that throughout our vast Empire the prevention of disease should be the first care.

The Weird Adventures of Professor Delupine of the Sorbonne. By GEORGE LINDSAY JOHNSON, F.R.C.S. London: George Routledge. 1917. Pp. 344. 6*s.*—Mr. George Lindsay Johnson appears to have been much impressed by some visits which he paid to the Salpêtrière Hospital with the view of inquiring into the phenomena of spiritualism. The weird adventures, which he narrates, were told to him as actual occurrences by "a professor of world-wide fame," and he has written them down with disguises of names, the object being "to clothe the real facts with a halo of romance." We credit Mr. Johnson with believing what he was told, as he alludes to the professor's story as "real facts," but we think that he displays more capacity for believing than he is likely to find among his readers. That will be due partly to the fact that he is quite unable to tell a story in a way that might be expected to produce any effect upon the intelligence of others.

The Bird of Life. By GERTRUDE VAUGHAN. London: Chapman and Hall. 1917. Pp. 309. 5*s.* net.—Much of this book is the result of accurate observation, but the heroine would have been a more interesting person if the exact career which she leads had not been, in its various episodes, led by the different heroines of other twentieth century novels. The book is very well written.

The Cameroons. By ALBERT F. CALVERT, F.C.S. London: T. Werner Laurie. 1917. 200 plates. Pp. 82 and xxxi. 6*s.* net.—As a faithful study of the origin and development of the colonial power of Germany this small book makes instructive reading. The text is very brief, but full of facts, while many of the numerous reproductions of topical scenes are explanatory of it. We did not find the author's map, plate 200, very helpful.

THE LANCET.

LONDON: SATURDAY, MAY 26, 1917.

The Study of Function in Disease.

THE routine examination of large numbers of adolescent and adult males necessitated by the needs of the naval and military services of this country has served to focus attention upon two very old and difficult problems—namely, the significance of cardiac murmurs and the test of the functional efficiency of the heart and circulation, particularly in those persons in whom the cardiac physical signs show some departure from the normal. Among the many important contributions to the study of the circulation made by Sir JAMES MACKENZIE, none are of greater practical value than his analysis of the varieties of cardiac irregularity with their significance, leading to insistence upon the necessity in all cases of apparent cardiac abnormality of applying some test of the functional capacity or efficiency of this organ from a mechanical point of view. His forceful and downright championship of these matters has involved him in more than one controversy. We publish in another column a long letter from him replying to critics, who accuse him of lack of reverence for those great clinicians of the past, by whose careful observation and record of symptoms and physical signs the foundations of our knowledge of heart disease were laid and the application of the newer methods to the study of function rendered possible. In commenting on the recent Lumleian lectures we suggested that the utilitarian value of recent cardiac work had escaped some of the critics of modern research, but the pioneer has his failings also. With Sir JAMES MACKENZIE'S letter we are in accord, but we feel that he has some of the impatience and intolerance of the pioneer. He pays a generous tribute to past workers, but we confess we do not quite understand his statement that in the literature in the English, French, and German languages he has not found a single case where the condition of the heart was clearly detailed and the reaction intelligently described.

Five years ago the late Sir JAMES F. GOODHART delivered a thoughtful and arresting Harveian oration before the Royal College of Physicians of London on the Passing of Morbid Anatomy. He pointed out the change in our point of view of pathological problems, developed within his own memory, whereby the processes of disease rather than their terminal effects were studied. The fruitful nature from the practical standpoint of this change must be apparent. It is in some such sense that we construe the main thesis of Sir JAMES MACKENZIE'S letter as a plea for the study of function rather than of state in disease; in other words, he would have us treat the condition of the patient with some disordered organ or system as a dynamic and not as a static problem. With this view we are in full sympathy, the more so that it is obviously of wider application than in the field of cardiology. The study of the patient, of his symptoms, and of their variation in relation to special demands made upon his several organs is a truly scientific mode of investigation, and it has already led to practical results. It is also a wholesome reaction against placing too great stress upon laboratory methods in the diagnosis and treatment of disease, because it inculcates a close study of the patient and the due perspective of symptoms, signs, and laboratory results. Sir JAMES MACKENZIE has frequently and in forceful manner insisted on this conception in relation to disorders of circulatory function, and his teaching is now generally accepted and followed. It is necessary for correct diagnosis and useful prognosis and for effective treatment to observe the patient and the variations in his symptoms and physical signs under conditions of effort or even stress.

Many other examples of the fruitful results of the application of this method of studying function and organic reactions will doubtless occur to our readers, but we may perhaps draw attention to a few of them. The study of renal function in health and disease by urologists has helped to raise this branch of surgery almost to the rank of an exact science, and has led to highly satisfactory advances in diagnosis and treatment. The functional efficiency of either kidney and the adequacy of the total excretory function can now be measured accurately, with the result that diagnosis, the decision as to what cases are suitable for operation, and the effects of treatment have all been greatly improved. The problems in medical diseases of the kidney are complex and treatment is difficult owing often to the irreparable nature of the damage, but there can be no doubt that there is here a fruitful field for research. In diseases of the lungs, more especially tuberculosis, the same principles are being applied, haltingly perhaps, while the search for an adequate specific treatment goes on. Hygienic-dietetic treatment in skilled hands demands the close personal study of each individual patient and the adjustment of the patient's daily life according to the state of his lesions and his response to effort, whether in the form of graded walks and rest or graduated labour. The day has long gone by when prognosis and treatment in this disease were appraised from the physical signs only; to-day symptoms, the temperature-chart and its reactions to rest and effort, the physical signs, the sputum, and even, where practicable, the blood reactions are all duly weighed in dealing with the outlook of the patient, his chances of recovery, and his ability to return to ordinary life or to work. A wide general recognition of these facts is desirable, as it would make for earlier and more accurate diagnosis, and for more careful selection of cases for sanatorium and other modes of treatment. The field for similar methods in diseases of the nervous system, both functional and organic, widens as diagnosis becomes more accurate and our knowledge of function of nerve structures increases. The principle will be applied to the symptoms produced by every organ in the body, and we cordially welcome Sir JAMES MACKENZIE'S insistence on the

scope for truly scientific research in the clinical field. There has been too great a tendency to regard clinical medicine as worked out, and to look upon the laboratory as the only place for accurate and scientific inquiry.

The Children's Crusade.

THE destructive power of infant mortality is now generally admitted, and the popularising of measures for dealing with it is the special concern of the National Baby Week Council, which held its first meeting last week. The week from July 1st to 7th is to be set aside for the following objects: To arouse the civic sense of racial responsibility in order to secure to every child his proper birthright of mental and bodily health; to inform the public of what is already being done for mothers and young children by existing agencies; and to indicate possible achievements if every citizen assumed his proper responsibility. On the need for such propaganda work opinion is not divided, and public attention has already been called to one great destroyer of child life. Sir WILLIAM OSLER, in an oration before the Medical Society of London, which we print this week, goes over the ground again in regard to the influence of venereal diseases on child production and child life. As a baby-killer the gonococcus has no great rôle, but as a misery producer it is the king among germs, responsible for 30–40 per cent. of all cases of congenital blindness and for a large proportion of sterile marriages. The case is still stronger against the *Spirochæta pallida*. Syphilis has long been the despair of the statistician, but Sir WILLIAM OSLER feels free to attribute 25 per cent. at least of the 100,000 stillbirths occurring each year in England and Wales to SCHAUDINN'S spirochæte; and of the 18,000 children dying annually before completing the first week of life, the practical pathologist and physician, he tells us, requires no statistician in order to enable him to attribute 95 per cent. of these deaths to syphilis. Venereal disease is one of the foes against which the children's crusade must be conducted to the death.

Other reasons responsible for infant mortality are variously assessed by different observers and schools of thought. In a further volume[1] just issued of a report to the Carnegie United Kingdom Trust, Dr. E. COEY BIGGER, the Medical Commissioner of the Local Government Board for Ireland, enumerates ten factors in the order of importance which he attributes to them in relation to the welfare of infants. He takes, as his first factors, the care of the mother before, during, and after labour and the advice given as to the management of the child. The factors which immediately follow—the economic conditions of the family, the domestic surroundings of the infant, the extra-domestic surroundings of the home, the health and habits of mother and father—have, for Dr. BIGGER, less importance than supervision of the mother's health and friendly advice tendered to her in regard to her child. On this point practical unanimity prevails amongst those who have had large experience in child-welfare work. It is therefore to the health visitor that the National Baby Week Council looks as one of the main agents of child welfare. A compendious report just issued by the Local Government Board for England gives the most recent statistical information. Just over 600 whole-time health visitors are now available in Great Britain to visit 700,000 babies, and only 800 to 900 infant-welfare and maternity centres are in existence where the Council consider 8000 to 9000 are needed. Hence, one of its main objects is to stimulate local authorities in dealing with these matters. One London borough is noteworthy for its refusal, recently emphasised, to appoint health visitors at all on the ground that no evidence has yet been adduced indicating that such appointments would accelerate the progressive fall in the infantile death-rate now taking place in the borough. It is, however, very difficult to interpret the remarkable drop in the figures for infant mortality occurring between 1915 and 1916 in the great towns and urban districts of the Tyne on any other ground than that of increased care for mother and child. Economic conditions have long been good and housing has not materially altered during the time. The National Baby Week Council should have no difficulty in making out a good case for the multiplication of health visitors.

The discretion of the medical profession in the treatment of infantile disorders will not be infringed by the employment of the agency of child welfare centres, while the whole campaign of National Baby Week is based on the coöperation of the general practitioner. Health visitor and welfare centre are what Dr. J. W. BALLANTYNE has called "listening posts" to detect impending danger and ward against it. In and by them health principles are inculcated; their object is to maintain health and not to treat illness. In so far as they are successful in their aim they strike at the root of medical practice; but this is inevitable, and the medical man himself is always in the position of a person engaged in sawing off the branch of the tree on which he is sitting. The Association of Infant Welfare and Maternity Centres does not affiliate local centres to itself unless and until they have a medical person in charge of the infant consultations attached to the centre. Organisation of the child-welfare campaign by some central authority will have the advantage of securing a broad view of the complicated factors—medical, hygienic, social, racial—at their beneficent work, while not excluding the coöperation of the general practitioner at the periphery. To us any local welfare scheme is unthinkable without the active interest and coöperation of all the general practitioners in the district. Nor does the memorandum of the Women's Coöperative Guild on the national care of maternity, as we understand it, necessarily clash with the interests of general practice. The Guild pleads for a strong Central Maternity Department at the proposed Ministry of Health and for the compulsory appointment of maternity committees by local public health authorities. The plea is ably framed, and such action may well be another line of attack in a campaign of many fronts.

[1] Two volumes of this report were noticed in THE LANCET of May 5th, p. 693.

Annotations.

"Ne quid nimis."

THE TREATMENT OF THE WAR CRIPPLE: STATEMENT BY THE MINISTER OF PENSIONS.

THE position of the war cripple has for long been a somewhat obscure one, and a flood of fresh light has been shed upon it by the important statements made last week by Mr. G. N. Barnes, M.P., Minister of Pensions, in answer to questions put to him by members of a deputation from the British Medical Association. The deputation included the Chairmen of Council and of the Insurance Acts and Hospitals Committees, and the medical secretary of the Association. The Insurance Commissioners were also represented. With regard to the status of the discharged disabled soldier under treatment, Mr. Barnes said that the question of the retention of the men in military hospitals and under military control might be regarded as settled. The War Office had agreed to keep the men in military hospitals as long as room could be found for them there, to give them certain curative and manual treatment, and on discharge to hand them over to the care of the local Pensions &c. Statutory Committees. These committees would also be responsible for the men when, on the conclusion of the war, many military hospitals were disbanded. For the treatment of the war cripple after the war three alternatives would be present: first, continuance of treatment at the military hospital, where this continued to exist; secondly, at a civilian hospital, if one was available; thirdly, failing both of these, treatment by the ordinary practitioner or the specialist according to the requirement of the individual case. Mr. Barnes added that he was committed to the provision of special treatment for the disabled man, whether within or without a hospital, and to the expense of such treatment, quite apart from any domiciliary treatment to which the man was entitled as an insured person. The small number of non-insured discharged men would, he said, be dealt with also by the Insurance Commissioners, retaining the same choice of doctor as insured persons possess. In regard to the additional cost of such domiciliary treatment, Mr. Barnes said that it had been decided to watch events and to compare the results with the experience of pre-war years. Approved Societies had assumed, he said, that there would be additional sickness and consequent increased financial risk. On the other side it had been urged that the open-air life and physical training of the Service would result in a diminished sickness incidence. Mr. Barnes laid on the House of Commons the primary responsibility for the fact that the medical profession was so slightly represented on the central and local Pensions Committees, adding that he was taking steps to remedy the omission. A circular, he said, had been issued by the central committee advising all the local bodies to avail themselves of the services of the practitioners in their district, and in particular to appoint medical men on the disablement subcommittees. Every local committee, he said, should have its medical adviser. For the Central Advisory Committee Mr. Barnes welcomed the nomination of three or four persons by the British Medical Association, with the addition of a consulting physician and surgeon nominated by the English Royal Colleges. Mr. Barnes's statement heralds, we hope, the beginning of an intelligent and comprehensive treatment of a difficult problem.

TRENCH FEVER AND TRENCH SHIN.

WE publish in another column an interesting contribution to the pathology of trench fever by Dr. H. Moreland McCrea, which tends to confirmation of the view that this condition is caused by a spirochæte, since observations on the Wassermann reaction made by Dr. W. E. Carnegie Dickson gave a positive result in the vast majority of cases, and treatment by galyl and grey oil gave relief in some cases and rendered the Wassermann reaction negative. In THE LANCET of March 3rd we commented upon the observations of Professor Riemer, who obtained spirochætes from the blood in this disease and was able to cultivate them, though he hesitated to assert that the spirochæte was the cause. Dr. McCrea and Dr. Carnegie Dickson's observations take the proof a stage further, and if the spirochætes are constantly demonstrated, or if they can be proved to be infective in similar fashion for animals, the demonstration will be complete. It seems to be clear that the more chronic forms of trench fever are less typical than the acute form, the description of the latter by different observers being singularly uniform. The paper we published in last week's issue of THE LANCET by Lieutenant-Colonel Graham Chambers on Trench Shin raises an interesting question. The condition, as he admits, presents many points of resemblance to certain chronic cases of trench fever and is by some observers considered to be of this nature. It would be of interest to find out if the spirochæte found in trench fever is also present in trench shin or if the Wassermann reaction is positive in cases of the latter condition. It is possible that the symptom-complex seen in trench fever may be produced by more than one specific organism. Lieutenant-Colonel Chambers regards trench shin as an infectious fibrositis, and his suggestion seems probable. We shall await observations upon the blood in these cases with interest, as they should throw light upon this question.

THE RE-EDUCATION OF THE BLIND.

AT the Annual Congress of the Ophthalmological Society the proceedings on one afternoon took the form of an inspection of St. Dunstan's Hostel, Regent's Park, the magnificent property placed at the disposal of the Blinded Soldiers' and Sailors' Care Committee by Mr. Otto Kahn. In the course of this visit Sir Arthur Pearson, the chairman of the Committee and President of the National Institute for the Blind, opened a discussion on the employment of the blind, to which Mr. Arnold Lawson and Mr. H. B. Grimsdale, among others, made useful contributions, and the whole subject has now received wide illumination by the issue of the report of the work of St. Dunstan's Hostel during the year ended March 31st last. At this date the blind inmates of St. Dunstan's, including the numerous annexes which have been added to the central mansion, numbered 354, while new accommodation has been provided for nearly as many more patients. The War Office has arranged now that all soldiers with badly damaged eyes shall reach St. Dunstan's

through the 2nd or 3rd London General Hospitals, and part of the success which has crowned systematic treatment has no doubt been due to the prompt sympathy and spirit of comradeship with which the new comers are received. Their re-education begins at once with simple lessons in net-making and Braille; in the workshops, where the scheme of re-education next takes them, their instruction is mainly given by men who some few months back were themselves blinded on the battle-field; and beyond the workshops expert tuition is supplied in poultry farming, massage, Braille shorthand and typewriting, and telephone operating. The report makes exhilarating reading. It is clear that these men, who have experienced what is popularly regarded as the severest physical disability which can be met with, accept under the pervading spirit of St. Dunstan's Hostel the optimistic view that though handicapped heavily they are not penalised out of all competition, but, on the other hand, may be enabled by patience to give a very good account of themselves in the race of life. We congratulate Sir Arthur Pearson and his energetic scientific coadjutors and administrative staff on the beneficent results of their efforts.

TRANSIENT PARALYSES IN MEASLES.

IN the spring of 1916 Dr. E. Aaser [1] had 190 cases of measles in Ullevaal Hospital. Seventy of these patients were adults, and had the disease in a mild form; the only complications were otitis media in four instances and pleurisy in one. The remaining 120 patients were children, of whom 65 had measles mildly, 55 in a severe form. Cultures of the nasopharyngeal mucus showed the presence of diphtheria bacilli in 13 of these 55 patients, and tracheotomy became necessary in 5, with 3 deaths; in addition, 11 of the children died from pulmonary complications. Dr. Aaser gives details of two other children who developed retention of urine and various muscular paralyses when their attack of measles was at its height, and makes no mention of the occurrence of diphtheria in either of them. The first case, a boy aged 9½, was sent in with the diagnosis of acute poliomyelitis; he had a well-marked measles eruption which had been present for a week, and for six days he had had extensive paresis of the muscles of the trunk and legs, together with urinary retention and overflow, but without any pain or hyperæsthesia. No complete paralysis could be found in the affected muscles, there was no atrophy, common sensation and sensation of heat were normal. The urinary retention lasted 17 days and was relieved by catheterisation. The muscular pareses improved after the first week, and a month after their onset the child could walk indifferently well. The second paretic patient was a child aged 4, who developed measles on April 24th, urinary retention on the 27th, and was admitted to hospital on the 29th with extensive pareses without any disturbances of sensation. Recovery from the pareses and retention followed as the measles eruption died away. Discussing the diagnosis in these two instances, Dr. Aaser says they may perhaps be regarded either as cases of abortive infantile paralysis with an initial morbilliform eruption, or as examples of measles combined with acute poliomyelitis. A third possibility—namely, that they were cases of measles with transverse myelitis, has also to be considered. Dr. Aaser notes that another case of measles occurred in a sister of the first patient a fortnight after the onset of his attack. He points out that the signs of paresis came when the attack of measles was at its worst and vanished with the rash, and he concludes that both his patients certainly did have measles. Again, neither child had the almost pathognomonic stiffness of the neck, profuse sweating, and hyperæsthesia seen in acute poliomyelitis; hence, he is inclined to think that, although a morbilliform eruption may occur in either the prodromal or the paralytic stage of infantile paralysis, and although a transient retention of the urine occurred in about a quarter of the 80 or 90 cases of acute poliomyelitis treated in his hospital four or five years ago, neither of his two patients had more than a severe and abnormal attack of measles. He has heard from a colleague of similar cases of paralysis in the course of measles, and asks for further information on the subject.

[1] Tidsskr. f. d. Norske Laegeforening, Christiania, 1916, xxxvi., 1074.

SPIRIT DUTY GRANTS TO VOLUNTARY HOSPITALS.

THE conditions under which voluntary hospitals may obtain supplies of spirit are announced, the question having been under the consideration of a Departmental Committee appointed by the Treasury since February, 1916. A circular, together with the forms for application, has been issued to the hospitals, pointing out that grants from the Exchequer are now available in relief or part relief of the duty paid upon spirit used solely for medical or surgical purposes. The grants are not available to institutions conducted for gain, but are intended to give relief in respect of payments of duty involved by the use in voluntary hospitals, supported by charitable contributions, of duty-paid spirit or drugs containing duty-paid spirit for medical use. Methylated spirit or spirit obtained free of duty under Section 3 of the Finance Act, 1902, does not come within the purview of the return, nor does the spirit used exclusively for scientific purposes, and the concession to medical requirements excludes potable spirits—e.g., brandy and whisky. In making a return figures are required as to the previous consumption of spirit based on the calendar year 1914, while grants may be applied for retrospectively as regards the years 1915 and 1916. Applicants are required to set out what proportion of spirit was allocated to out-patients and to in-patients, and the Local Government Board expect to be informed of the method by which such allocation was made, the data on which it rests, and the definition of "new out-patient" adopted by the hospital. A copy of the printed report of the hospital is asked for in regard to each of the years 1914, 1915, and 1916 respectively, and when the printed reports do not show separately the receipts other than from charitable contributions, a statement of such receipts is required. As to the category of charitable contributions, those principally excluded from this are subsidies from State or municipal funds, payments made to the hospital in respect of the supply of nurses, by patients, or by the War Office or Admiralty connected with the accommodation of sailors or soldiers. To sum up, the returns come under four headings: (1) Quantities of alcohol used in the year ending Dec. 31st, 1914, for medical and surgical purposes only; (2) amount of solution of iodine 2 per cent. made with duty-paid alcohol, if not

made in hospital; (3) the proportion of the total amount of 90 per cent. alcohol represented by the above uses for (*a*) in-patients and (*b*) out-patients, and the average amount of duty-paid alcohol 90 per cent. represented by the above used (*a*) per in-patient, (*b*) per out-patient; and (4) the receipts for the years 1914, 1915, and 1916 respectively from other than charitable contributions.

AURICULAR FLUTTER DISCOVERED BY RADIOSCOPY.

IN the *Journal of the American Medical Association* of March 17th Dr. G. W. Holmes and Dr. P. D. White have described a case in which auricular flutter was discovered in what appears to be a novel manner—by radioscopy. A painter and paper-hanger, aged 62 years, was referred to the Massachusetts General Hospital for diagnosis. He had been well until four months previously, when attacks of pain in the region of the umbilicus began. They were most frequent in the early morning, awaking him about 2 o'clock and compelling him to rise and pace the floor. Gradually the pain had become more persistent and was present much of the time. Hot applications gave some relief. There was no nausea or vomiting. No relation could be discovered between the time or kind of the meals and the pain. Yet the patient complained of indigestion, was afraid to eat much, and had lost 30 lb. in the four months. He was slightly constipated. There was no dyspnœa or præcordial pain. On examination he was pale and under weight. All the teeth were artificial and the tongue was coated. Percussion showed slight enlargement of the heart. The action was regular and rapid (115 to the minute). The sounds were faint and clear. Radioscopy after a bismuth meal did not show any abnormality of the gastro-intestinal tract. The right and left borders of the heart were then clearly outlined, when the left was seen to be pulsating regularly at the rate of 115 to the minute and the right at twice that rate. Auricular flutter was diagnosed, and the diagnosis confirmed by the electrocardiograph, which showed auricular flutter with a 2:1 a.-v. block. Right vagal pressure increased instantly the grade of the block, bringing out clearly the separate auricular deflections. The case suggests a possibly fruitful form of investigation in an obscure group of cases.

MEDICAL MUSEUMS.

LARGE and important questions came up for discussion at the recent annual meeting, held in New York, of the American Section of the International Association of Medical Museums. This section represents the leading medical museums and laboratories of the United States and Canada, and is presided over by Dr. O. Klotz, of Pittsburgh, Pa., Dr. Maude E. Abbott, of McGill University, being secretary-treasurer. The session opened with the despatch of a telegram to Washington placing the services of its workers and resources in its special field of research at the disposal of the National Committee in the present emergency. The establishment of a central bureau for the permanent preservation of the results of scientific research, especially histological material, to be used for purposes of study by scientific workers throughout the country, was brought forward by Dr. M. C. Winternitz, of Baltimore, and a committee appointed to organise such a bureau. A discussion took place on the clashing of the time of meeting in New York of the four societies of kindred nature—viz., the American Association of Pathologists and Bacteriologists, the American Section of the Medical Museums Association, the Cancer Society, and the American Association of Immunologists. It was resolved that some sort of federation should be attempted, so as to present subjects of common interest to combined audiences. A number of papers were read on museum and laboratory technique, museum teaching, the proper presentation of the results of medical research, and kindred matters. The International Association, of which the American Section is but a part, includes in its membership most of the museum curators in this country. Most successful meetings of this Association were held in London during the International Medical Congress of 1913. The Museums Association has done much to improve the technique employed in preserving and mounting of specimens. This matter has a considerable importance at the present time, for it is necessary for the progress of military surgery that a complete record should be made of the wounds and diseases suffered by our soldiers.

THE NATIONAL COMMITTEE FOR RELIEF IN BELGIUM.

THE United States Government has assumed responsibility for the work of the Commission for Relief in Belgium, and it has been decided that the National Committee for Relief in Belgium will suspend its appeals for subscriptions to the British public. Donations received after June 1st will be held to provide for emergencies now unforeseen in connexion with relief in Belgium. This course of action is in accordance with the suggestion made by Mr. H. C. Hoover, chairman of the Relief Commission, who is now in Washington, and has the approval of His Majesty's Government and the Belgian Minister. During the existence of the National Committee, whose second annual meeting will be held at the Mansion House on June 15th, over £2,400,000 have been subscribed through its medium for the relief of Belgium. As will be seen from the letter of Dr. H. A. Des Vœux in another column, the work of the Belgian Doctors' and Pharmacists' Relief Fund continues without interruption.

TALC IN TABLETS.

Mr. Albert E. Parkes, F.I.C., has been examining medicinal tablets and finds that many of them contain quantities of talc sufficient, he suggests, to cause gastro-intestinal disturbance. Mr. Parkes states that in the process of manufacture of compressed tablets it is generally necessary to mix with the powdered drug after granulation a so-called lubricant to ensure the mass flowing freely from the hopper to the dies and also to prevent the finished tablets from sticking to the dies and to each other. Various agents have been used for this purpose, one of which is talc, or French chalk, in the use of which it is generally advised to limit the amount to 1 or 2 per cent. Many of the cheaper varieties of tablets on the market were, however, found to contain talc in amounts far exceeding this. Mr. Parkes's attention was first called to the composition of soda-mint tablets, a sample of which had caused unpleasant symptoms. They were found on analysis to contain 5·5 per cent. of insoluble matter which proved to be talc.

Fourteen different samples of these tablets were then purchased from shops in various localities, and on examination

12 of these were found to contain talc, and while three contained from 1 to 2 per cent. only, the remaining nine samples contained the following amounts respectively: 2·1, 2·6, 2·8, 3·5, 4·0, 4·6, 5·4, 5·5, and 6·5 per cent. The tablets containing the smaller amounts were better compressed and of superior finish, so that the larger amount of talc could not be justified on manufacturing grounds. The worse varieties were purchased loose and were, no doubt, cheap imitations of well-known brands. The price varied from 2*d.* per ounce for the inferior samples to 4d. for the better qualities, which were supplied in bottles. Other compressed tablets were then bought and investigated such as potassium chlorate, potassium bicarbonate, potassium bromide, ammonium bromide, lithium citrate, nux omica, quinine sulphate, calomel, aspirin, salol, antipyrin, phenacetin, and phenacetin and caffeine, and a sample each of milk tablets, bismuthated magnesia, and indigestion tablets. Twenty samples in all were examined, and ten of these, which comprised the cheaper varieties of well-known tablets, contained the following percentage amounts of talc: Nux vomica, 7·8; calomel, 5·7; aspirin, 8·1, 14·8, and 18·6; salol, 3·4; antipyrin, 1·9; phenacetin, 0·5; bismuthated magnesia, 6·0; indigestion tablets, 8·0. (The two last samples are of special interest as the tablets were recommended for digestive trouble.)

The varying amounts found tend to show that talc is used indiscriminately. It does not appear to be absolutely essential, as the tablets of certain well-known firms of manufacturers were free from it or contained it in minute quantities only. In conjunction with others,[1] Mr. Parkes has previously called attention to the practice of using talc in excessive amounts as a coating and ingredient of pills. Although no injury to health has been definitely traced to the ingestion of this substance, authorities are agreed that its unnecessary and excessive use is objectionable. In 1909, for example, the Local Government Board in a pamphlet[2] called attention to the growing habit of polishing cereals such as rice and barley with talc, and the danger to health which might follow from their use as food when so treated, and Lowe and Taylor, in THE LANCET of June 18th, 1910, report a case of pancreatic calculus in a man attributed to the consumption of rice polished with talc. Talc is a silicate of magnesium, and is almost insoluble in strong acids. The use of finely-powdered glass as a constituent of a food or drug would be unhesitatingly condemned, yet the two substances are almost indistinguishable microscopically. The ingestion of such inert siliceous matter in any but minute quantities may be attended with some risk owing to the irritation which it is liable to set up. It would be interesting to learn, Mr. Parkes concludes, if any of the victims to appendicitis and intestinal complaints have been in the habit of consuming food or drugs containing talc.

WE regret to learn the death of Dr. Major Greenwood, whose activities in the cause of Poor-law reform and medical politics generally are well-known to all our readers.

THE House of the Royal Society of Medicine, 1, Wimpole-street, London, W., will be closed on Whit-Monday, May 28th.

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[1] Parkes and Roberts, Analyst, 1911, 389; Parkes and Major, Phar. Jour., 1914, 712.

[2] Report of the Inspector of Foods, No. 8.

DONATIONS AND BEQUESTS.—By the will of the late Rev. Henry Whitehead Moss the testator left £1000 to the Salop Infirmary and £500 to the Eye, Ear, and Throat Hospital, Shrewsbury.—The late Miss Hooper, of Leamington, has left by will legacies of about £5000 or £6000 to the Birmingham and Midland Hospital for Women and the Warneford Hospital, Leamington.—The late Mr. Richard Holder Luckett, of Erdington, Warwick, has bequeathed £1400 among six Birmingham hospitals.

THE GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

TUESDAY, MAY 22ND.

THE General Medical Council commenced its session at its offices, 44, Hallam-street, W. Sir DONALD MACALISTER, the President, was in the chair.

New Members.

Dr. Edward Coey Bigger took his seat on the Council as Crown nominee for Ireland, and Mr. Holburt Jacob Waring, M.S., F.R.C.S., as representative of the Royal College of Surgeons of England.

The President's Address.

Sir DONALD MACALISTER then delivered the presidential address. He said:—

Medical practitioners and medical students continue to be called up for military service in large and increasing numbers. Of both, the numbers remaining for medical duties at home, and for the future recruitment of the profession, are so reduced as to cause some misgiving. The Professional Committees appointed under the Military Service Act in Great Britain, and the analogous Central Committee in Ireland, have done strenuous and successful work in supplying military requirements on the one hand, and in providing for the claims of civilian practice on the other. Their powers are limited; yet their energy and resource, and the general willingness of the profession to endure all things for the common cause, have helped them to overcome many obstacles. Difficulties, however, remain, which the existing organisation may be unable to meet.

The question whether the time has come for a more effective system of professional "mobilisation," that is, for a temporary measure of general control, extending to all practitioners, and directing their distribution according to the nation's need for service, has been brought by several medical bodies before Mr. Neville Chamberlain, the Director-General of National Service. He invited me, as your President, to take the chair at a Conference of representatives of the Professional Committees and of certain Government Departments held on March 14th and 15th in London. Definite proposals on the subject of the better distribution of our resources were unanimously adopted, after full discussion, by the Conference. It is understood that these proposals are under consideration by the Government; but so far I have not learned what action has been taken upon them. A similar Conference took place at the same time with representatives of the British Dental Association. Mr. Tomes and I, at the request of the Director-General, were present. The conclusions arrived at have also been communicated to the Government; but again we are unaware of the result.

In the meantime the Secretary of State for War, under pressure of a sudden emergency, has decided to apply the compulsory provisions of the Military Service Act to all medical men of military age in Great Britain. At first the application was made in a form that practically nullified the efforts of the Professional Committees to safeguard the civil population. On being made aware of this untoward result, Lord Derby modified the form of his requisition, and so restored to the Committees the opportunity of exercising their functions under the Act. I understand that now, with the support of the profession in general and of the authorities, these Committees are again busily occupied in finding a practical solution of the national problem; though the difficulties of the problem are not growing less. The sources of supply for service abroad and at home are, in fact, becoming severely straitened; and many branches of ordinary civil work must of necessity suffer curtailment. It is, in my opinion, doubtful whether, without fresh legislation, the present powers of the authorities concerned will suffice to cope with all the demands of the situation. The position of affairs, as apprehended by those who have most carefully examined it, has been clearly placed before the National Service Department and the Government. With them, not with the profession, now lies the responsibility for the next step. The loyalty to national duty hitherto shown by medical practitioners as a body gives assurance that to the limit of their power they will respond to further calls should the needs of the country make further calls imperative. But to ensure the best results from their devotion a closer coördination of competing authorities, and a more effective control of the actual distribution of medical services at home and abroad, are now much to be desired.

At the request of the Director of Recruiting I have obtained, from the deans and registrars of medical schools in the United Kingdom, a return of the number of students actually pursuing medical study in January, 1917. The results have been communicated to your Emergency Committee and to the Government. The detailed figures are given in the minutes of the Executive Committee for Feb. 26th, 1917. It appeared from the return that, while in May, 1916, the whole number of medical students was 6103 (including 1379 women), in January, 1917, the whole number was 6682 (including 1735 women). As might be expected, the increase was mainly in the first and second years. The fourth and final years, taken together, were stationary. The third year, which will supply the practitioners of 1919, numbered in January only 572 men and 261 women. Since February, however, a fresh call, extending to one group of medical students not classified as "fit for General Service," has reduced still further the numbers I have given. It is now clear that, certainly in the years 1918 and 1919, and probably in the present year, 1917, there will be a serious falling-off in the number of practitioners added to the Register. In the years 1920 and 1921, however, we may expect an increase in the number of registered practitioners, both men and women. The Director of Recruiting, in making his calls on the student youth of the nation, has had all these facts before him, and I have to acknowledge that he has given them the consideration we should expect from an officer who is himself familiar with the requirements of medical education. The conditions of paper-supply and labour have delayed the issue of the Minutes and the official Registers. A new impression of the British Pharmacopœia, 1914, will presently be required, and the cost to the Council will be considerably augmented; but in view of the national importance of the work it will not be expedient to propose the raising of the selling price beyond that fixed by the Treasury in 1914.

The use of glycerine for munitions of war has imposed close restrictions on its employment in pharmacy. Sugar also is not to be had without difficulty; and prescribers have been advised to avoid ordering the official syrups as vehicles or adjuvants. The Pharmacopœia Committee is awaiting definite information on these matters from the Government Departments immediately concerned. The Council may think it expedient to empower the Committee to act officially on its behalf in regard to the question, should the necessity arise.

In pursuance of a resolution of the Council of the Pharmaceutical Society of Great Britain, the Privy Council has issued an Order which places, in Part I. of the Poisons Schedule of the Pharmacy Act, 1889, emplastrum plumbi and like preparations of lead, whether sold as diachylon or otherwise. This Order will have the effect of restricting the sale of this poison for internal use, and so of diminishing a serious public danger.

Two Government measures now before Parliament include provisions which have recently formed the subject of representations by the Council. The Venereal Disease Bill, 1917, prohibits under penalties anyone not a registered medical practitioner from treating such diseases, and from prescribing or advising remedies therefor. It moreover prohibits all persons from offering by public advertisements or announcements to treat patients, or to prescribe, advise, or recommend medicines or preparations of any kind, in relation to venereal disease. The first prohibition will apply to any area within which an approved scheme for free treatment is in operation. The second will apply to the whole kingdom. The Criminal Law Amendment Bill, 1917, extends the Indecent Advertisements Act to non-professional announcements or advertisements, which suggest the use of drugs or appliances for specified purposes of an objectionable kind. The Council has long desired such reforms, and will welcome these enactments.

In response to an invitation from the Lord President of the Privy Council the Council has submitted to the Government a memorandum on the present state of the law respecting the practice of dentistry, both in this country and in the British Dominions.

In the Union of South Africa a measure is now before Parliament which is intended to have the effect of prohibiting altogether the unqualified practice of medicine, including dentistry, throughout the Union. As a federal University of South Africa has been established, possessing the power of conferrieg medical degrees, we may expect before long a request for the application to the Union of Part II. of the Medical Act, 1886. When reciprocity is thereby arranged with South Africa, another step, and that practically the last that remains, will have been taken towards the medical confederation of the Empire. Our allies Italy, Japan, and Belgium already stand in similar relations with this country: and it may be that the Council's next duty will be the endeavour to bring about some form of reciprocity with other allied and friendly nations, where the standards of medical education and qualification are not inferior to our own.

The Government has appointed a committee to inquire into the position of natural science in the educational system of Great Britain, especially in secondary schools and universities, and the President and the Chairman of the Students' Registration Committee were accordingly asked to give evidence. We attended on March 13th and furnished the committee with full information on the Council's functions and activities, together with statistics and estimates, based on facts within the Council's knowledge, concerning the present and prospective supply of medical and dental students and practitioners, and the provision for their instruction in pure and applied science. The relations between the professional curriculum and secondary education, both general and scientific, were naturally discussed with the committee. I explained that the Council had recently widened its regulations so as to admit of the recognition, for purposes of registration, of "Senior" Preliminary Examinations accepted for matriculation in the Faculties of Arts and Science; but that the content of the "Junior" Examinations, accepted from candidates for registration who had not completed a full course of secondary education of the "Senior" standard, was still to be settled by the Council. This question may come up for further consideration on a report from the Education Committee, and perhaps from the Dental Education and Examination Committee also. It is much to be wished that the result of the Government committee's recommendations may be the establishment in England of a system of school leaving certificates, based on well coördinated plans for secondary education applicable to the whole country. The Council has repeatedly expressed its sense of the need for the introduction of such a system. Apart from its obvious national advantages, it would go far to free the Council from the task of appraising a multitude of preliminary examinations in school subjects, which the existing want of system has forced us to undertake in the interest of professional efficiency.

The Finance Committee will be in a position to report that in 1916 the income of the several Councils exceeded their expenditure by over £1000. The surplus is, however, much less than that for 1915, and somewhat less than the average for the preceding seven years. It is not to be expected that it will recover its former level for some years to come. Meanwhile all accrued charges for our new building have been defrayed from the accumulations of past years, and all available balances have been invested in War Loan Stocks.

Owing to the incidence of Whit Monday on May 28th it will be highly inconvenient for the Council to sit beyond Saturday of this week. But I foresee no difficulty in completing by that day all that we have to do at this session.

Other Business.

It was formally intimated that medical reciprocity had been established with the Province of Manitoba.

The Council appointed its committees. The Executive Committee consists of Dr. Norman Moore, Dr. Taylor, Mr. Tomes, Dr. Langley Browne, Mr. Hodsdon, Dr. Norman Walker, Sir John Moore, and Sir Arthur Chance. The Penal Cases Committee is as follows: Mr. Tomes, Sir F. Champneys, Dr. Norman Walker, and Sir B. Windle.

Dr. F. Taylor was appointed junior treasurer.

The Council adjourned.

WEDNESDAY, MAY 23RD.

The Council was engaged during the whole sitting in considering complaints against medical practitioners.

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.—The annual general meeting of the London and Counties Medical Protection Society, Limited, was held at the offices of the Society, 32, Craven-street, Strand, London, W.C., on May 16th. Colonel E. C. Bensley, who was in the chair, in proposing that the annual report and balance-sheet be received and adopted, delivered a short address reviewing the work of the society during the past year. He referred to the action taken by the society in supporting its members in difficulties which had arisen between them and the military authorities in regard to payment for examining recruits and to the work which had arisen through defects in the machinery of the National Health Insurance Act. The resolution adopting the annual report and balance-sheet was carried unanimously, with expressions of gratitude to the general secretary and the solicitors. It was unanimously resolved—

That as from Jan. 1st, 1917, at the end of each year payment should be made to any member of council—not a salaried official—residing more than four miles from Charing Cross, of first-class return railway fare, provided he has attended not less than half the meetings of the council or committees of council to which he has been summoned.

Colonel Sir John Rose Bradford, the President of the society, the treasurers, secretaries, and auditors were all re-elected.

DIFFICULTIES IN THE ADMINISTRATIVE CONTROL OF TUBERCULOSIS.

BY JOHN GUY, M.D. GLASG., M.R.C.P. EDIN., D.P.H. CAMB.,
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IN the departmental (Astor) report on tuberculosis some of the most perplexing problems connected with this disease are handled with a delightful simplicity. Early cases are to be cured in the sanatorium. Working capacity is to be regained at a colony. Advanced cases are to be segregated in a hospital, and for the sake of completeness it might be added, the dead are to be buried in a cemetery.

Wholehearted attempts to deal with this disease on the lines indicated in the report soon reveal the fact that there are profound problems connected with this disease which are not easily solved, and, indeed, some appear at present almost insoluble.

From the clinical standpoint cases of tuberculosis are classified into three grades—early, intermediate, and advanced—but from an administrative point of view they might be classified as non-infectious and infectious. In such a classification the basal idea is the safety or otherwise of the community, but the patient himself is not necessarily thereby lost sight of. The aim of the administration should be to prevent the non-infectious from sinking to the ranks of the infectious, and, if possible, to make the infectious non-infectious, or at least render them harmless to the community.

The Non-infectious Class of Cases.

The non-infectious cases are divisible into three very distinct classes: (*a*) Early cases where the tuberculous process has not advanced to the breaking-down stage; (*b*) cases where the tuberculous lesion is old and is in a healed or cicatricial condition; and (*c*) cases where a cicatricial lesion exists complicated by the presence of some other pulmonary disease, such as bronchitis, emphysema, silicosis, &c.

It is not always easy to distinguish clinically between these separate sets of cases, and it is too commonly assumed if a lesion be detected in a lung that it is a commencing one requiring active treatment. Patients with cicatricial lesions in their lungs are excellent cases for sanatorium or other form of treatment, and they do almost as well as those assumed cases of pulmonary tuberculosis where, in fact, no lung lesion exists.

When the pulmonary condition is reckoned to be of recent origin the best form of treatment is undoubtedly a residence in a good sanatorium, although many do equally well in their own homes. In the majority of instances perfect recovery may be expected. Occasionally, however, cases occur where the disease progresses in spite of all treatment, and passes on through the infectious stage to a fatal termination.

The difficulties, clinical and administrative, are great where these cicatricial lesions are complicated by the presence of other pulmonary diseases, such as bronchitis, &c., and these cases are very numerous; unfortunately, there is always a demand for sanatorium treatment for them. The medical attendants are glad to get rid of these cases for a time, and the patients and their friends are anxious to try anything that gives promise of relief. While it must be admitted that in some of them there is marked improvement by a residence in a sanatorium, on discharge they soon fall back into their old condition. The only method of dealing with them is to admit them to the sanatorium for a short period of observation and determine the cause of the illness. If it be found that this is due to bronchitis, &c., and that the tuberculous focus is inactive, then the patient should be discharged as not suffering from tuberculosis.

The administrative procedure is clear when the curable cases are under consideration. They should be kept in a sanatorium until cured. The carrying out of this prescription is not, however, quite so simple as it appears. In the first place, the patients, after a term of residence, often feel so well that they insist on returning to work before a cure is complete, and nothing but force will detain them. If compelled to remain against their will, they mope and are discontented, and further progress toward recovery is extremely unlikely. In the second place, family considerations compel many to return to work too early. When a breadwinner is laid aside the family income is often hopelessly insufficient and the wage-earner is compelled to return to work prematurely in order to satisfy the clamant need of the family. In the third place, when the mother is ill difficulties equally great present themselves. The children often cannot be cared for satisfactorily in her absence, and the mother insists on returning home to her duties long before she is able to do so. The problem here at present is often quite insoluble and the mother returns to her work until utterly unable to perform it.

How the Administrative Difficulties may be Met.

Here, then, are three separate administrative difficulties which have to be faced. If the patient is curable then he ought to be cured, and this must be kept prominently in view when attempting to solve the various problems. When the patient wishes to return home because he feels so well that he assumes he is cured, in the great majority of instances he can be persuaded to spend the requisite time by the sanatorium superintendent. Compulsory retention is quite useless, and a wise and tactful superintendent can usually accomplish the desired end by personally dealing with the patient. When a breadwinner is laid aside and is compelled to return prematurely to work the only satisfactory solution appears to be that the family should receive a special sickness grant so as to ensure that the income is made equal to what it would be if the wage-earner were working. What chance of recovery has any patient who is continually haunted by the knowledge that the family at home are bordering on starvation and may only be kept alive by getting into debt as far as possible?

There would appear to be four probable sources from which money might be granted to make up the deficiency in the family income. 1. From philanthropic agencies. These are quite inadequate as a rule, and many agencies exclude tuberculous patients from benefit owing to the chronicity of the disease, 2. From the Poor-law. While in many cases doubtless the Poor-law authorities deal generously with the sick poor, as a rule the tendency is not toward generosity. Again, there is still a healthy prejudice in the minds of most working men against accepting Poor-law relief, so that on the whole it is neither likely nor desirable that the income should be augmented from Poor-law sources. 3. From a special municipal fund. Unfortunately no special fund for this purpose is in existence, nor, in view of present economic conditions, is one likely to be created. Still, it appears desirable that there should be such a fund, as the money spent in half-curing a patient is so much money wasted if he has to leave the sanatorium owing to financial difficulties at home. 4. From the National Insurance funds. For insured persons—and these constitute the bulk of male patients—it would appear equitable that an extra money grant should be given from Insurance funds to meet their financial strain while undergoing treatment. It is a recognised fact that the insured person in the matter of tuberculosis is doubly taxed. He is taxed as an insured person for sanatorium benefit and he is taxed as a ratepayer to keep up the city sanatorium. Such an anomalous condition ought to cease and institutional treatment should be provided by the local authority alone. The funds then in possession of the Insurance Committee for tuberculosis could be made available for other purposes, one of which might be the augmenting of the family income while the wage-earner was undergoing treatment.

When the mother of a family suffers from tuberculosis problems arise which are at present wellnigh insoluble. Speaking generally, mothers do not seek advice until the disease is well marked and the prospect of cure very much lessened. If the mother has a young baby at home it is very seldom that she will consent to a prolonged separation from her child. When there are several young children it is often a difficult matter to make provision for them while the mother is in the sanatorium, and the knowledge that the children are not properly cared for causes her much anxiety. In Edinburgh an attempt is made to meet this difficulty through assistance granted by the Royal Victoria Hospital Trust. In some cases the children are sent to different relatives; in others they are boarded out in a country home; but it is felt that this is a

duty which might properly devolve upon the local authority. This might be done by the municipality itself providing a temporary home, or by entering into an agreement with some other voluntary body to provide one. Suitable arrangements would be made for the father to contribute towards the maintenance of the children.

The Infectious Class of Cases.

The second class of patients—namely, the infectious—presents many intricate administrative difficulties. For clearness of argument they may be divided into three classes: (1) Where there is a likelihood of cure; (2) where the disease is advancing and a fatal termination may be expected in a few months; and (3) where the disease is practically stationary and an indefinite period of infectious life, probably of many years' duration, may be looked for.

In those cases where a cure may be looked for, sanatorium treatment, if deemed necessary, should be enforced. The chief difficulties in this class have already been discussed. In the patients with advancing disease the bedfast stage soon comes. In the poorer homes where accommodation is scanty removal to the hospital is often asked for, and in Edinburgh is always provided. At other times a mild compulsion is applied and the patient removed. In many cases, however, the relatives insist on the patient being left at home to die. Such an attitude is quite understandable, although not desirable from an administrative point of view. The best that can be said is that the period of risk to the others in the family is of comparatively short duration. Such cases should be dealt with on their individual merits, and compulsory removal should be effected where the home conditions are bad.

The greatest difficulty is presented by the chronic consumptive who lives for years and yet is in an infectious condition all the time. There is no possibility of curing him, so prolonged institutional treatment is out of the question. Compulsory segregation for this class, assuming it could be carried out, would mean a prison with a barbed-wire fence all round to preclude possibility of escape. It would also mean that any individual suspecting that he had consumption would avoid all medical aid until dying.

If the chronic consumptive cannot be cured, can he be educated so as to diminish the risk to others? This depends on the patient and on the sanatorium where he undergoes a short course of education. Even with the best training the ultimate conduct of the average working-class patients leaves much to be desired. Many of them, to their credit be it said, do their utmost to carry out the principles taught. Unfortunately, some sanatoriums teach nothing.

What, then, can be done with these chronic cases? If capable of work they should be encouraged to do what they can if thereby they are not a danger to others. If, however, the other workers object to have a tuberculous individual working in the same room, what then? Here is an actual case. A high-class dressmaker contracts tuberculosis and the disease, in spite of treatment, is progressing. She is still capable of some amount of work, but the work-girls object to her presence. She cannot now turn to any other form of occupation, nor is it desirable that she should continue dressmaking. She is in receipt of 5*s*. per week as disablement benefit, but this is insufficient for her needs. Surely, it seems desirable that this individual in her last year or two of life should be shielded from the twin curses of illness and poverty. We cannot now prevent the illness, but it appears to me that some measures should be taken to alleviate the poverty. If for the safety of the community a patient be excluded from his usual work, then the community should provide other suitable work or compensate such patient. This appears the only logical outcome. The compensation in the case of insured persons should come from the National Insurance funds.

The protection of the other members of the family forms a serious problem. Compulsory segregation not being attainable, a voluntary segregation might be successful if the rules of the institution could be so relaxed that the patient might be permitted a few hours off every afternoon or every alternate afternoon to visit his family. This would lessen the risk to the family considerably, although it would not abolish it altogether. There is much to be said both for and against such partial segregation, but it appears to merit a trial.

In other instances a measure of protection might be given by removing the family to a larger and better situated house. Here the patient might have a room set apart for his sole use, and by frequent visits of the tuberculosis nurse a certain standard of ventilation and cleanliness could be insisted on. The municipality in such cases should provide the better house, and pay, or assist in payment of, removal expenses. The segregation in such cases would be incomplete, but the healthier environment would act in increasing the resistance to the disease through improved health.

The whole question of segregation bristles with difficulties, and there is a grave possibility that at present too much attention is given to the germ and too little to the conditions which assist its growth and spread. The suggestion of the municipality providing better accommodation should be seriously entertained, and in the end it would probably save much hospital expense.

Summing up in conclusion, the curable should be sent to a sanatorium and moral suasion used to persuade them to remain until cured. In order to enable this being done the family income should be supplemented where necessary. In the case of a mother being ill the municipality in some instances should be prepared to care for the children during her illness. In the case of patients with advanced and progressing disease some should be compulsorily segregated and others provided with a separate room. The most difficult cases are the chronic ambulant infectious patients. With them voluntary segregation might be tried, with some modification of the sanatorium or hospital routine. Larger and better housing might be provided, with closer supervision and greater cleanliness and ventilation. The local authority should provide the institutional treatment, and the Insurance Committee should dispense its funds as a special tuberculous disablement benefit. In a city like Edinburgh this would mean that a sum approximating £3000 per annum would be available for special grants in necessitous tuberculous cases.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM: ANNUAL CONGRESS.

(*Concluded from p. 771.*)

THE proceedings of the Congress on Thursday afternoon, May 3rd, took the form of a visit to St. Dunstan's, Regent's Park, where the various activities and methods of training in operation were inspected, under the direction of Sir Arthur Pearson, Bart.

Visit to St. Dunstan's and a Discussion on the Employment of the Blind.

Sir ARTHUR PEARSON said St. Dunstan's had set an entirely new pace in the blind world. It was very important to try to abolish from the minds of the afflicted men morbid thoughts on their own condition; it not only resulted in greater happiness for them, but enabled the men to make the best use of their faculties by concentrating on the work in hand with a view to earning their independence. Very great assistance in the training was derived from the employment of blind pupil-teachers, for they were able to bring to the work the standpoint of one similarly afflicted. Owing to the intense application involved in the training the actual work was not allowed to extend beyond two and a half hours in the morning and a like period in the afternoon. The men were taught not only how to work, but also how to play, and rowing on the lake, horse-riding, and other forms of recreation were freely indulged in. He had received very high praise of the work done by the skilled blind masseurs who were fully trained and certificated in the institution, and the shorthand and typewriting abilities of many were good enough to command salaries up to the usual standard. Men whose work had been of a special supervising and advisory nature had been able to resume this work in their former posts with credit. Sir Arthur Pearson concluded with some remarks on the highly developed sense of proximity among blinded people. He attributed this to three factors—echo, difference in air pressure, and difference in temperature, which became apparent to the alert senses remaining.

Mr. ARNOLD LAWSON said that before the war very few agencies attempted the systematic training of the blind in all its aspects: there was a good deal of overlapping and much inefficiency. The crowd of young blinded men who had now been thrown on their country raised the question of the training of the blind to one of national importance.

The brilliant initiative of Sir Arthur Pearson had as the basis of its success the centralisation of effort, so that St. Dunstan's had become a centre where all aspects of training—moral, social, and economic—were fostered and encouraged. Those who set out to train the blind must be themselves trained. Here the blind man was taught how to live as a blind man, to be encouraged and supported in his initial difficulties by the companionship and experiences of others similarly placed. There was no fixed limit of tuition; the blind man had come to be trained, and he was kept until that had been accomplished, so that he was turned out as an active and independent citizen. A very important corollary was the after-care department, which followed up and looked after the blinded man when he sought to occupy a place in the world. This was necessary because in a blind man's work mistakes crept in which, not having been seen, remained uncorrected, wrong work thus becoming a habit, and the quality of the work deteriorating. He also needed protection in the buying of materials and against the designs of unscrupulous persons. He advocated marriage for the blinded young man; to a peculiar degree he needed someone to give him sympathetic care and to keep him neat and tidy, but every care should be taken to safeguard him from being exploited by unsuitable women. Mr. Lawson believed that this organisation, brought into being by the war, would prove a blessing in the future to ordinary cases of blindness arising in civil life.

Mr. H. B. GRIMSDALE discussed the question from the standpoint of his experiences the Normal College for the Blind. He pointed out that the handicap of blindness was at its greatest in the case of the craftsman and much lessened in the professional man, whose brain was as keen and efficient as when he could see, and his memory more highly trained. Sir Arthur Pearson's memory, for instance, though always good, was now prodigious. He emphasised the point that no one employment was good for all blinded persons. Hence it was a mistake to concentrate on one kind. There would always be a certain number of civilians of middle age blinded at their work, but the really important matter was to see that every blind child had his chance. He proceeded to detail the work done at the Normal College and some of the characteristic results obtained.

The discussion was continued by Captain A. W. ORMOND, Captain CRUISE, and the PRESIDENT. Sir ARTHUR PEARSON replied.

Clinical Meetings and Discussions.

Friday morning was devoted to visits to witness operations at the Royal London Ophthalmic Hospital, the Royal Eye Hospital, Southwark, and the 2nd London General Hospital, Chelsea, and the afternoon was occupied by a clinical meeting at the Royal London Ophthalmic Hospital, at which a very large number of cases were exhibited and discussed.

On Friday evening the following papers were read and discussed:—

Mr. W. B. INGLIS POLLOCK: Two cases of Leber's Disease (Hereditary Optic Atrophy), with X ray examination of the sella turcica.—The same subjcet was fully discussed by Mr. J. HERBERT FISHER.

Mr. G. MACKAY: A case of Uveo-parotitis with Irido-cycloplegia.

Mr. C. WORTH: Remarks upon Advancement Operations.

Mr. A. LAWSON: A case of Detachment of the Retina at the Ora Serrata.

Mr. E. CLARKE: Ophthalmometry in Estimating the Refraction of the Eye.

Mr. L. PATON: Spasm of Accommodation.

Lieutenant-Colonel R. H. ELLIOT: Operation of "Couching" of Cataract as Performed in India: its History, its Technique, and its Exponents.[1]

Mr. J. H. PARSONS: The Apocritic Principle and Visual Sensations.

On Saturday morning a discussion was held on

Concussion Injuries to the Visual Apparatus.

Captain A. W. ORMOND, in opening the debate, confined his attention to the subdivision contusio bulbi, leaving to others the consideration of contusio cerebri. His paper was based upon cases he had met with at the 2nd London General Hospital and at St. Dunstan's. The dictionary defined concussion as a condition induced by more or less violent shaking of some particular organ whereby serious symptoms might be induced, to account for which no definite lesion could be detected. But owing to the enormous power of modern explosives, violent shaking or concussion might lead to very definite lesions. The paper dealt with cases in which there had been injuries the result of vibrations conveyed from a distance. Violence transmitted through the bones of the skull was able to reach the inner tunics of the eye. Blows on the sides of the orbit could be transmitted through the sclerotic and produce serious concussion of the retina or choroid. And the part of the eyeball unprotected by bone might be influenced by air vibrations, many cases of serious damage to the globe having been recorded as due to "windage," in which, so far as could be ascertained, no solid particles struck the face. Vibration could so affect the outer surface of the eyeball, without disintegrating the dense sclerotic, as to pass through it with sufficient force to rupture the less firmly knit choroid and retina. In some cases the globe had been, in this way, entirely disorganised. Concussion or contusion effects could be produced in four different ways: (1) By vibrations the result of metal or other particles traversing the orbits; (2) by vibrations the result of blows on the bones of the orbit and face transmitted to the interior of the eyes; (3) by vibrations transmitted to the deeper parts of the globe through the corneo-scleral tunic without rupture of the eyeball; (4) by vibrations the result of windage. Captain Ormond then proceeded to deal in detail with the various structures of the globe as they had been affected by concussion injuries, and gave a tabulated list of cases to illustrate his remarks. With regard to treatment, he insisted on the extreme usefulness of the hot coil—i.e., a pad of lint or a bandage through which a graduated electric current is passed. In assuaging the pain of a bruise of the eye this, in the author's opinion, has no equal. His belief was still strong that mechanical means were best for hastening the absorption of vitreous or retinal hæmorrhage. He had not hesitated to deal with complete traumatic cataracts as soon as the eye had recovered from the immediate effects of the traumatism, and in only one case had he had cause to regret doing so. That single exception was one in which a piece of wood was present in the ciliary body, and a septic irido-cyclitis developed, which resulted in a shrunken fluid eye. In dealing with wounds which involved the air cavities flanking the orbits, free drainage was necessary. Hot fomentations frequently applied formed the best dressing for wounds about the orbits, which were almost invariably septic.

Dr. S. A. KINNIER WILSON, in a paper dealing with injuries of central origin, said the whole question of commotio was still shrouded in considerable obscurity, looseness of conception being responsible for some clinical confusion. In some of these cases which had proved fatal the closest investigation had not revealed recognisable anatomical lesion. In most instances of severe blow on the head there were capillary hæmorrhages, minute lacerations of the cerebral substance, and consequent disintegration of myelin. With the blow there had been a sudden dispersion of cerebro-spinal fluid, which tended to escape too abruptly by the natural exits. Complete recovery might ensue, even after severe symptoms. The term "cerebral contusion" was more applicable to cases in which recognisable organic changes had occurred, as it excluded mere "functional" disturbance. Oppenheim holds that the basis of "shock" is cerebral commotio. Fickler believes that the conception of concussion of the spinal cord, of purely molecular origin, is not admissible. The experiments of Alan Newton showed that there was an organic basis for the transient disturbances of function seen in so-called "railway spine" and allied conditions. There might be a surprising amount of tissue change from a feeble impact. The tremendous speed of projectiles in warfare rendered ordinary pure commotio almost impossible. Hence cases of pure visual concussion in the war were very few; he excluded cases in which there had been a shell explosion in the near vicinity. The case which approached most nearly to pure commotio among those he had seen was that of a soldier, aged 19, who was hit on the back of the head by a shell fragment while cutting wood in a dug-out. He lost consciousness for three minutes, reviving when his mate moved his right arm, which had also been hit and was very painful. He felt very sick, and was quite blind in both eyes, remaining blind for 40 to 48 hours. On the third day he was able to see dimly with each eye. There was no dysmetropsia. The same afternoon a small piece of bone was removed from the orbit, and a little later another piece. The shadowy objects which he saw at first had no colour, while shutting his eyes did not always banish the image. These subjective phenomena disappeared after about a fortnight. Two months later, the pupillary reactions and the optic discs were normal, vision 6/60 in both eyes, Jaeger 14 in both. There was a concentric diminution of both fields for white and colours, and marked visual fatigue. A skiagram showed that the outer table was splintered, and the inner one cracked. This certainly was not a case of traumatic hysteria; moreover, except for the visual symptoms, there was no impairment of function of the nervous system discoverable. Dr. Wilson's conclusion was that visual impairment after generalised commotio cerebri was far more rare than was labyrinthine or other auditory impairment.

[1] THE LANCET, 1917, i., 325. 361.

The PRESIDENT (Mr. E. Treacher Collins) contributed to the discussion with remarks on sub-choroidal hæmorrhage from concussion, and its relation to (*a*) "commotio retinæ"; (*b*) "holes at the macula"; (*c*) pigmentation of the retina; and (*d*) pigmentary disturbance at the macula. Subchoroidal hæmorrhage was, he said, a condition with which ophthalmic surgeons were most familiar when it occurred after intra-ocular operations, such as extraction of cataract or iridectomy for glaucoma. Probably in these cases the choroidal vessels were sclerosed and brittle, when, owing to diminution of intra-ocular pressure, the blood rushed in and expanded them. The pressure of the suffused blood forced the choroid inwards and the contents of the globe forwards towards the wound, from which, in many cases, some of it escaped. Indirect rupture of the globe also produces subchoroidal hæmorrhage, as might occur in the intact eyeball after concussion. In the latter case the blood effused tended to accumulate as a flattened layer rather than as a prominence, probably because it met with resistance from the sclerotic externally. Subchoroidal hæmorrhage must be differentiated from intrachoroidal hæmorrhage. The former was probably, he thought, due to rupture of the larger vessels in the outer layer, and the latter to an effusion from the capillary and inner layer. An effusion of blood external to the choroid would not be visible as such ophthalmoscopically. The obstruction to the choroidal circulation produced by subchoroidal hæmorrhage was not necessarily permanent; the effusion of blood causing it must cease as soon as it was produced. Berlin described the clinical appearances of an eye affected with commotio retinæ as considerable diminution in the acuity of vision in the centre of the field and marked resistance of the sphincter papillæ to the influence of atropine, followed shortly afterwards by distinct haziness of the fundus and possibly small hæmorrhages. The changes were most marked around the yellow spot. The highest development was reached in 24 to 36 hours, and it disappeared in two to three days. Sight much improved at first and then remained stationary. Haab found that of 167 cases of concussion of the eyeball 82·6 per cent. showed no alteration in the fundus. Mr. Collins believed Berlin's observations to be correct. He thought it still remained to be proved whether concussion injuries of the eye might result in extra-ocular rupture of a ciliary artery, but there was definite evidence that they might produce subchoroidal hæmorrhage. Following severe contusion of the eye there might be pigmentary disturbances of the macula, causing permanent impairment of vision.

Captain CRUISE, Sir GEORGE BERRY, Mr. A. L. WHITEHEAD, Dr. GEO. MACKAY, Dr. T. HARRISON BUTLER, Mr. A. B. CRIDLAND, and Mr. P. C. BARDSLEY continued the discussion, and Captain ORMOND replied.

An interesting addendum to the Congress took the form of a museum of drawings, pathological specimens, and ophthalmoscopes, which was under the charge of Mr. W. H. MCMULLEN who read a paper on the History of the Development of the Ophthalmoscope.

THE CONTROL OF VENEREAL DISEASES.

Phenol Serum in Gonorrhœa.

Dr. F. Guillermo Cano, professor of genito-urinary diseases in the Medical School of San Salvador, C.A., states that as the result of two years' laboratory work he has produced a definite chemico-biological substance, known as methyl-phenol serum, and that he has proved its efficacy and safety in the treatment of more than 3000 private and hospital patients. The results were published in the Archives of the Rosales Hospital, San Salvador, in 1910 and in November, 1913. Four years of clinical experience with this method have enabled him to summarise as follows:—

1. The treatment of gonorrhœa by intravenous injections of this serum until the disease has reached its declining stages prevents complications. 2. Pain, discomfort, and all other subjective and objective symptoms usually disappear after the fourth or fifth injection, and definite clinical and bacteriological cures are effected in from 30 to 40 days. 3. Ten injections are usually sufficient when the infection is attacked at its onset. 4. Gonorrhœa, when complicated by primary or secondary syphilis, successfully responds to the treatment if additional antisyphilitic medication is employed. 5. Local complications, such as epididymitis, buboes, abscesses, &c., together with systemic manifestations such as toxæmia and the paragonococcal lesions, disappear more rapidly with this form of treatment than with any other, and surgical interference is rarely necessary. 6. By the use of intravenous and intraprostatic injections of the serum months, not years, are required to cure chronic residual prostatic gonorrhœa and its numerous recrudescences.

It is claimed that an intravenous injection of 10 c.c. of methyl-phenol serum or an intraprostatic injection of normal phenol serum is non-toxic. A paper on the above treatment by Dr. F. G. Cano, Dr. Terry M. Townsend, and Dr. Julius J. Valentine, of New York, was read before the American Urological Association at its annual meeting in Chicago, Illinois, on April 2nd–4th last by Dr. Townsend. Dr. Townsend and Dr. Valentine have administered between six and seven hundred intravenous injections of methyl-phenol serum and 67 intraprostatic injections of normal phenol serum in 73 selected private and hospital patients. It is from the latter series of infections covering a period of almost one year that they have made their clinical observations and deductions. Their conclusions are as follows:—

1. Methyl-phenol serum may be injected repeatedly intravenously in doses of 10 c.c. into adults at intervals of 48 hours without danger or detriment to life or health. 2. Its use has a tendency to prevent complications by killing or rendering inert the invading gonococcus at the site of residence. 3. For the same reason and because of the neutralisation of gonotoxins it shortens the course of the gonorrhœa and alters a vicious into a benign infection. 4. Its use causes general increased economic resistance, hence gonorrhœal sequelæ are rare. 5. Intraprostatic injections of normal phenol serum are harmless when correctly performed, frequently cause a rapid disappearance of gonococci from the prostatic secretion, and invariably shorten the time required to cure chronic gonorrhœal prostatitis. 6. The treatment of gonorrhœa by the application of Cano's theory of intravenous injections of methyl-phenol serum and intraprostatic injections of normal phenol serum is firmly based upon chemico-biological facts and accepted authoritative theories, and bears the same relation to gonorrhœa that intravenous injections of arsenical preparations bear to syphilis. 7. This is the first application of the immutable laws of chemico-biology to gonorrhœal infection, and forms the basis for a scientific and uniform treatment of gonorrhœa.

According to Dr. Cano, the rôle of either an intravenous injection of methyl-phenol serum or an intraprostatic injection of normal phenol serum is that of an antiseptic, and its effects are due to the action of phenol on the gonococcus and its toxins at the site of infection, locally, and within the body, systematically by means of the blood stream. It is to be sincerely hoped that further results, or a more widespread use of this mode of treatment, may substantiate the claims made for its efficacy by the authors of the paper.

A Syphilis Number of the "Indian Medical Gazette."

The *Indian Medical Gazette* for April, 1917, contains a special supplement of 34 pages, with four essays on Recent Advances in the Treatment of Syphilis, the result of a recent competition. Lieutenant-Colonel J. T. Calvert, I.M.S., principal of the Calcutta Medical College, and Lieutenant-Colonel W. D. Sutherland, I.M.S., imperial serologist, acted as judges, awarding the prize to Dr. Rajendra Kumar Sen, of the Dejvo Tea Company, Lakhimpore, North Assam. The other three essays published are by Lieutenant-Colonel E. E. Waters, I.M.S., Captain T. Crawford Boyd, I.M.S., and Saret Chandra Ghose, L.M.S. While not adding anything new to the subject of syphilology, the four papers form a summary of recent work which cannot fail to be of use for reference to other workers.

Enlightenment Campaign.

Mr. N. Bishop Harman has written a little book, entitled "Staying the Plague" (Methuen's Health Series. 1917. Pp. 120. Price 1*s.* net), in which he sets forth in clear language and with striking illustration the main facts of sex, of venereal disease, and of the means of preventing such disease. The book is intended to help in widening the awakening due to the report of the Royal Commission into an intelligent and progressive activity, and is, we think, well fitted to this end. The medical reader will find material usefully arranged for teaching purposes. Kipling's paraphrase, "The fathers have eaten of forbidden fruit and the children's teeth are notched," will be fresh to many.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Nursing Board for Ireland.

THE Nursing Board for Ireland, established by the Royal College of Surgeons in Ireland, has held its first meeting under the presidency of the President of the Royal College of Surgeons, Lieutenant-Colonel William Taylor, who has been elected chairman of the Board. The College has nominated four members of the Board—Lieutenant-Colonel W. Taylor, Lieutenant-Colonel Sir Arthur Chance, the Right Hon. Dr. Michael F. Cox, and Dr. T. P. C. Kirkpatrick, and with them are 22 nurses elected by representatives of the nursing profession. A committee was appointed to draft by-laws.

Tuberculosis in Co. Tyrone.

At a meeting of the Tyrone Insurance Committee held on May 12th Dr. E. C. Thompson, surgeon to the Omagh County Infirmary, criticised severely the treatment of tuberculosis patients in the county of Tyrone. He pointed out that though a large amount of money was being spent there was no report issued to give the public an opportunity of judging whether they were getting value for it. As an expert, expressing the opinion of experts, he could say they were practically getting no value, and that, he averred, was the opinion of nearly every doctor in the county. Criticising the constitution of the County Council Tuberculosis Committee, he said every expert in the county had been left out with the exception of their own official. He was not casting any reflection on their tuberculosis medical officer, but the whole system was wrong, and the only way to treat the disease was to get at the root of it. There should be better housing, inspection of school children, and an attempt made to stop the ravages of drink. There can be no doubt that in Ireland the means for dealing with tuberculosis are producing no results, as is clear from the fact that the mortality for tuberculous disease per 1000 in 1915 was 2·20, which is 0·13 above that for 1914, and 0·03 above the average rate for the period 1910–14. In England and Wales in 1915 the rate was 1·5. The statistics for 1916 are not yet published.

An Inquiry at Portrane Asylum.

The Inspectors in Lunacy recently held an inquiry into the circumstances surrounding the death of a patient in the Portrane Auxiliary to the Richmond Asylum. From the evidence given it was established that when one of the assistant medical officers was summoned in the middle of the night to attend the patient, he declared that he was off duty and referred the messenger to his colleague. The latter also said that he was off duty, and although the two medical men met and engaged in some controversy neither visited the patient, who died an hour later. The inspectors comment strongly on the refusal of both medical officers to attend in reply to an urgent message, and on their standing on their supposed rights. Their conduct was, the inspectors said, alien to the traditions of the medical profession. At the next meeting of the Richmond Asylum committee both officers were called on to resign.

May 22nd.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

To be temporary Surgeon: E. Bayley.

ROYAL ARMY MEDICAL CORPS.

To be temporary Lieutenant-Colonels: E. H. Taylor and A. R. Parsons.

To be acting Lieutenant-Colonels while in command of a Casualty Clearing Station: Major A. M. MacLaughlin and Brevet-Lieut.-Col. A. H. Safford.

To be acting Lieutenant-Colonel whilst in command of a Stationary Hospital: Capt. (temp. Major) J. A. Manifold.

To be acting Lieutenant-Colonel while in command of a Field Ambulance: Capt. Francis W. M. Cunningham.

Major Raymond L. V. Foster and Temp. Capt. J. G. Johnston relinquish the acting rank of Lieutenant-Colonel on re-posting.

To be temporary Majors: Temp. Capts. C. S. Read, S. W. Woollett, and E. A. Chartres, and J. C. Briscoe, W. A. Winter, R. C. B. Maunsell, and K. E. L. G. Gunn.

To be temporary Captains: F. W. H. Hutchinson, L. A. Walker, F. Fraser, R. B. Taylor, Temp. Lieut. E. W. Honsinger (Canadian Army Dental Corps), E. C. Black, W. C. Mayo, G. D. Laing, Lieut. D. H. Coats, W. Boxwell, C. E. Boyce, F. H. McC. Crawley, and E. J. M. Watson.

To be temporary Captains while employed at the Belfast Orthopædic Hospital: S. T. Irwin and C. G. Lowry.

To be temporary Lieutenants: E. J. Peill, P. C. Leslie, G. H. U. Corbett, W. R. Reeds, H. A. Richards, A. Fraser, J. H. Ashworth, B. V. Ward, D. M. Humby, J. Blakely, J. H. Clatworthy, J. H. Porter, A. Roemmele, R. W. Brown, J. J. S. Scrase, W. St. J. Cogan, H. C. Malleson, H. M. Thompson, J. Wells, H. Cox, J. B. Anderson, R. F. Lunn, W. R. Read, W. Kingdon, F. G. Power, C. Gordon, S. H. S. Taylor, H. F. Lumsden, J. W. Miller, F. E. Larkins, M. Stewart, H. A. Edwards, F. H. Kitson, J. S. Crichton, F. Anderson, D. McDougall, F. R. L. Atkins, J. I. Greig, E. H. Smith, M. Macleod, G. Burnet, S. H. Robinson, R. Larkin, J. Campbell, A. H. G. MacKintosh, H. A. Evans, H. G. Arnott, L. L. Winterbotham, W. B. Griffin, W. Messer, J. Jenkins, E. Thorp, W. S. Alderson, T. S. Sharpley, F. M. Longson, J. S. Soulter, A. Chance, E. G. Stanley, C. G. McAdam, K. G. Colquhoun, J. S. E. Selby, G. C. McL. Barber, P. J. D. O'Malley, A. C. Reid, C. H. Wilson, J. T. Daly, J. E. MacFarlane, R. W. H. Hillis, H. N. Marrett, W. H. Pallett, P. A. Wedgwood, P. M. Reid, W. Fleming, D. Higgins, W. D. Ross, P. de S. Smith, A. J. M. Paget, W. A. Watson, S. C. Jellicoe, S. B. Depree, W. H. Roache, P. A. Mitchell, O. Marshall, H. MacKenzie, C. Alison, G. Maxted, P. R. Chevreau, T. Craig, K. D. Marriner, E. Lewis, R. W. Eddie, R. G. Williams, F. I. Dawson, R. H. G. Oulton, A. H. Southam, A. H. Holmes, J. W. Johnstone, E. E. Willis, B. J. O'Donnell, J. B. O'Reilly, G. Birch, R. H. S. Torney, F. G. Smyth, R. W. Reid, A. S. Rose, W. Martin, F. Brickwell, A. C. Campbell, A. G. Wilson, H. Leach, F. C. Trapnell, W. Waugh, C. Elliott, W. J. Lord, T. C. Innes, W. L. Stuart, N. Beattie, D. Mackinnon, J. Buchanan, W. T. Lydall, J. S. W. Nuttall, W. Chapman, A. P. Nicolle, E. A. Bullmore, H. R. Crisp, E. G. von B. Bergh, R. Buchanan, W. H. Woodyer, H. J. Henderson, A. C. Wilson, H. R. Carter, H. G. Barrie, R. S. Topham, T. W. Lonsdale, L. C. W. Cane, F. M. Bishop, A. J. Turner, R. C. Muir, J. W. Power, F. MacK. Matheson, H. D. Ledward, W. St. C. McClure, W. A. Sharpin, O. W. Jones, H. R. Elliott, G. P. Humphry, S. M. MacKenzie, A. N. Hodges, R. A. McCrea, E. L. Jones, R. F. Ballantyne, F. R. Carroll, G. McQ. Brunton, D. M. Cox, M. Horan, J. Owen, A. B. Scott, W. Smith, S. S. Brook, E. A. Edington, C. E. A. Goddard.

Officers relinquishing their commissions: Temp. Major R. H. Crosse, Temp. Capts. (on account of ill-health) T. Mulcahy and W. V. T. Styles, Temp. Lieut. T. A. MacKenzie.

SPECIAL RESERVE OF OFFICERS.

To be Lieutenants: C. V. Pearson, P. B. Pinkerton, and A. J. B. Griffin (from Manchester University Contingent O.T.C.); J. D. Johnson (from Durham University Contingent O.T.C.); J. Allison, J. B. Hanna, W. McElroy, R. B. Smith, J. Aitken, J. L. Hill, J. M. Martin, J. H. Neill, F. J. Jack, and H. Patlansky (from Edinburgh University Contingent O.T.C.); F. W. Hebblethwaite, H. F. Hollis, C. L. Somerville, J. W. W. Baillie, A. McA. Blackwood, J. MacD. Clark, A. Dick, J. R. R. Holms, W. H. Kerr, J. Liddell, F. C. Logan, K. McAlpine, A. D. C. McGowan, D. W. M. MacKenzie, W. D. Miller, W. H. Palmer, J. W. Patterson, H. B. Sergeant, A. W. Smith, and R. Wiggins (from Glasgow University Contingent O.T.C.); R. R. Garden, A. C. Irvine, W. W. Nicol, and R. Thom (from Aberdeen University Contingent O.T.C.); J. H. Davison (from Queen's University, Belfast, Contingent O.T.C.); H. W. Lewis, J. E. Carpenter, E. B. Andreae, A. G. E. Wilcox, H. J. C. Churchill, E. D. Spackman, A. O. Bolton, and W. J. FitzG. Powell (from University of London Contingent O.T.C.); R. Nixon, E. Bramley, J. M. Morrison, L. C. Rudd, D. Lennox, E. S. Stubbs, C. Shearer, T. G. Roche, and W. C. MacKinnon (from Unattached List, T.F.), and H. W. Featherstone.

Lieutenant (on probation) F. M. Rorie is confirmed in his rank.

TERRITORIAL FORCE.

Lieut.-Col. J. F. Dobson, from temporary retired pay list, to be Lieutenant-Colonel, with precedence as from October, 1914.

Lieutenants to be Captains: S. F. H. Everill, G. Thomson, A. G. Banks, and A. E. Raine.

Major J. R. Williams relinquishes his commission on account of ill-health.

Capt. (temp. Major) J. Innes relinquishes his commission on account of ill-health, and is granted the honorary rank of Major.

URBAN VITAL STATISTICS.

(Week ended May 19th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 14 4, against rates declining from 18·5 to 15·3 per 1000 in the five preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 13·9, or 1·5 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 5·9 in Smethwick, 6·3 in Acton, and 7·1 in Hornsey, to 26·2 in Carlisle, 26·3 in Great Yarmouth, and 26·6 in Middlesbrough. The principal epidemic diseases caused 377 deaths, which corresponded to an annual rate of 1·2 per 1000, and included 204 from measles, 61 from whooping-cough, 59 from infantile diarrhœa, 35 from diphtheria, 10 from enteric fever, and 8 from scarlet fever. The deaths from measles were 48 fewer than the number in the previous week, and caused the highest annual death-rates of 2·5 in Bolton, 3·1 in West Bromwich, 3·3 in Rotherham, 3·8 in South Shields, and 4·1 in Middlesbrough. The 673 cases of scarlet fever and 1160 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 34 and 19 below the numbers remaining at the end of the previous week. Of the 4669 deaths from all causes in the 96 towns, 155 resulted from violence. The causes of 38 deaths were uncertified, of which 6 were registered in Birmingham, 5 each in Liverpool and Manchester, and 4 each in St. Helens and Carlisle, but only 1 in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 17·0, against rates declining from 18·4 to 15·9 per 1000 in the three preceding weeks. The 393 deaths in Glasgow corresponded to an annual rate of 18·4 per 1000, and included 42 from measles, 33 from whooping-cough, 4 each from diphtheria and

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING APRIL, 1917.

(*Specially compiled for* THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1916.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.								Deaths from all causes.	Death-rate per 1000 living.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON...	4,237,387	—	348	559	—	30	1	17	203	46	1	1205	3·7	—	337	10	49	44	9	61	510	1·6	5902	18·2
West Districts:																								
Paddington	130,668	—	6	13	—	1	—	1	3	—	—	24	2·4	—	50	—	—	2	—	2	54	5·4	213	21·3
Kensington	152,144	—	6	14	—	3	—	—	4	1	—	28	2·4	—	22	—	1	—	—	2	25	2·1	244	20·9
Hammersmith ...	117,965	—	8	14	—	1	—	—	6	2	—	31	3·4	—	3	—	1	—	1	3	8	0·9	137	15·1
Fulham	149,428	—	5	18	—	—	—	1	5	5	—	34	3·0	—	15	—	4	2	—	4	25	2·2	192	16·7
Chelsea	57,298	—	1	2	—	—	—	—	2	1	—	6	1·4	—	1	—	—	—	—	—	1	0·2	83	18·9
City of Westminster	132,853	—	5	10	—	—	—	2	3	1	—	21	2·1	—	2	1	1	—	—	1	5	0·5	184	18·1
North Districts:																								
St. Marylebone ...	98,573	—	8	16	—	—	—	—	5	—	—	29	3·8	—	27	—	2	—	—	1	30	4·0	163	21·6
Hampstead	81,470	—	5	14	—	1	—	—	—	1	—	21	3·4	—	2	—	—	—	—	1	3	0·5	96	15·4
St. Pancras	196,812	—	12	36	—	2	—	1	6	5	—	62	4·1	—	15	—	6	1	1	7	30	2·0	336	22·3
Islington	309,359	—	28	46	—	2	—	1	20	7	—	104	4·4	—	18	1	1	3	—	3	26	1·1	437	18·4
Stoke Newington...	49,776	—	4	13	—	1	—	—	4	1	—	23	6·0	—	1	—	2	2	—	—	5	1·3	60	15·7
Hackney	209,636	—	18	23	—	1	—	—	10	1	—	53	3·3	—	—	—	4	—	—	1	5	0·3	263	16·4
Central Districts:																								
Holborn	38,161	—	1	6	—	—	—	—	1	—	—	8	2·7	—	6	—	1	—	—	3	10	3·4	62	21·2
Finsbury	74,230	—	12	12	—	1	—	1	1	—	—	27	4·7	—	7	—	1	—	—	1	9	1·6	117	20·5
City of London ...	20,113	—	—	2	—	—	—	—	—	—	—	2	1·3	—	—	—	—	1	—	—	1	0·6	20	13·0
East Districts:																								
Shoreditch	99,932	—	16	16	—	2	—	—	17	3	—	54	7·0	—	1	1	1	—	1	—	4	0·5	166	21·7
Bethnal Green ...	115,552	—	12	14	—	—	—	1	8	1	—	36	4·1	—	7	1	—	—	—	3	11	1·2	157	17·7
Stepney	258,395	—	21	49	—	—	—	—	15	2	—	87	4·4	—	8	—	6	1	—	7	22	1·1	312	15·7
Poplar	155,095	—	8	27	—	3	—	2	14	1	—	55	4·6	—	20	1	1	1	—	8	31	2·6	232	19·5
South Districts:																								
Southwark	177,166	—	25	22	—	—	—	—	16	—	—	63	4·6	—	9	2	3	4	2	—	20	1·5	287	21·1
Bermondsey	113,661	—	28	31	—	—	—	1	9	—	—	69	7·9	—	11	—	1	—	—	—	12	1·4	172	19·7
Lambeth	283,729	—	20	49	—	—	—	—	11	1	—	81	3·7	—	20	1	—	9	1	4	35	1·6	410	18·8
Battersea	159,402	—	15	5	—	—	—	—	3	4	—	27	2·2	—	11	1	—	1	—	—	13	1·1	213	17·4
Wandsworth	310,858	—	30	23	—	—	1	4	4	2	—	64	2·7	—	33	1	3	7	—	4	48	2·0	381	16·0
Camberwell	249,749	—	21	33	—	8	—	1	11	2	—	76	4·0	—	24	—	6	8	1	3	42	2·2	352	18·4
Deptford	107,696	—	8	16	—	—	—	—	8	—	—	32	3·9	—	4	—	—	—	—	2	6	0·7	142	17·2
Greenwich	94,452	—	2	14	—	1	—	—	5	2	—	24	3·3	—	8	—	2	1	1	—	12	1·7	135	18·6
Lewisham	162,901	—	15	9	—	1	—	—	6	1	1	33	2·6	—	4	—	2	1	1	—	8	0·6	182	14·6
Woolwich...	130,313	—	3	11	—	1	—	1	6	2	—	29	2·9	—	8	—	—	—	—	1	9	0·9	154	15·4
Port of London ...	—	—	—	1	—	1	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

infantile diarrhœa, and 2 from scarlet fever. The 107 deaths in Edinburgh were equal to an annual rate of 16·8 per 1000, and included 15 from measles, 6 from whooping-cough, and 1 from diphtheria.

Irish Towns.—The 141 deaths recorded in Dublin were equal to a rate of 18·4, or 1·9 per 1000 below that recorded in the previous week, and included 3 each from whooping-cough and infantile diarrhœa, and 1 each from measles, scarlet fever. and diphtheria. The 141 deaths in Belfast corresponded to an annual rate of 18·7 per 1000, and included 2 from enteric fever.

VITAL STATISTICS OF LONDON DURING APRIL, 1917.

In the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the ten diseases specified in the table was equal to an annual rate of 3·7 per 1000 of the population, estimated at 4,237,387 persons in the middle of the year; in the three preceding months the rates were 4·0, 4·2, and 4·4 per 1000 respectively. The lowest rates last month were recorded in Paddington, Kensington, Chelsea, the City of Westminster, the City of London, and Battersea; and the highest rates in Stoke Newington, Finsbury, Shoreditch, Poplar, Southwark, and Bermondsey. The prevalence of scarlet fever showed a considerable decline last month; among the several metropolitan boroughs this disease was proportionally most prevalent in Finsbury, Shoreditch, Bethnal Green, Southwark, and Bermondsey. The Metropolitan Asylums Hospitals contained 712 scarlet fever patients at the end of last month, against 800, 811, and 785 at the end of the three preceding months; the weekly admissions averaged 93, against 111 and 102 in the two preceding months. Diphtheria also was less prevalent than it had been in other recent months; the greatest proportional prevalence of this disease last month was recorded in St. Marylebone, Hampstead, St. Pancras, Stoke Newington, Holborn, Finsbury, Shoreditch, Stepney, Poplar, Bermondsey, and Lambeth. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1420, 1453, and 1367 at the end of the three preceding months, had further declined to 1206 at the end of last month; the weekly admissions averaged 142, against 168, 165, and 161 in the three preceding months. Enteric fever was rather less prevalent than in either of the two preceding months; the 30 cases notified during the month included 8 in Camberwell, 3 in Kensington, 3 in Poplar, and 2 each in St. Pancras, Islington, and Shoreditch. There were 25 cases of enteric fever under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 29 at the end of each of the two preceding months; the weekly admissions averaged 4, against 4 and 6 in the two preceding months. Erysipelas was proportionally most prevalent in Stoke Newington, Shoreditch, Poplar, Southwark, and Bermondsey. The 46 cases of cerebro-spinal meningitis included 7 in Islington, 5 in Fulham, 5 in St. Pancras, and 4 in Battersea; and a case of poliomyelitis was notified in Lewisham. The 17 cases of puerperal fever notified during the month included 4 in Wandsworth, 2 in the City of Westminster, and 2 in Poplar.

The mortality statistics relate to the deaths of persons actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the four weeks ending April 28th the deaths of 5902 London residents were registered, equal to an annual rate of 18·2 per 1000; in the three preceding months the rates were 18·4, 21·3, and 18·3 per 1000 respectively. The lowest rates last month were 13·0 in the City of London, 14·6 in Lewisham, 15·1 in Hammersmith, 15·4 in Hampstead and in Woolwich, and 15·7 in Stoke Newington and in Stepney; the highest rates were 20·9 in Kensington, 21·1 in Southwark, 21·2 in Holborn, 21·3 in Paddington, 21·6 in St. Marylebone, 21·7 in Shoreditch, and 22·3 in St. Pancras. The 5902 deaths from all causes included 510 which were referred to the principal infectious diseases; of these, 337 resulted from measles, 10 from scarlet fever, 49 from diphtheria, 44 from whooping-cough, 9 from enteric fever, and 61 from diarrhœa and enteritis among children under 2 years of age. The lowest death-rates from these diseases were recorded last month in Chelsea, the City of Westminster, Hampstead, Hackney, and Shoreditch; and the highest rates in Paddington, Fulham, St. Marylebone, Holborn, Poplar, and Camberwell. The 337 deaths from measles were 130 in excess of the average number in the corresponding period of the five preceding years; this disease was proportionally most fatal last month in Paddington, Kensington, Fulham, St. Marylebone, Holborn, Finsbury, Poplar, Bermondsey, Wandsworth, and Camberwell. The 10 deaths from scarlet fever were only one-half of the corrected average number, and included 2 in Southwark. The 49 deaths from diphtheria were 8 in excess of the average, and included 6 in St. Pancras, 6 in Camberwell, 4 in Fulham, 4 in Hackney, 3 in Southwark, and 3 in Wandsworth. The 44 fatal cases of whooping-cough were 85 below the corrected average number, and included 9 in Lambeth, 8 in Camberwell, 7 in Wandsworth, 4 in Southwark, and 3 in Islington. The 9 fatal cases of enteric fever were 4 in excess of the corrected average, and included 2 in Southwark. The 61 deaths from diarrhœa and enteritis among children under 2 years of age showed a decline of 2 from the average number; the greatest proportional mortality from this cause was recorded in Hammersmith, Fulham, St. Pancras, Holborn, Stepney, and Poplar. In conclusion, it may be stated that the aggregate mortality in London last month from these principal infectious diseases was 9·7 per cent. above the average.

THE LATE SIR HUGH LANE'S MAGNIFICENT RED CROSS GIFT.—It will be remembered that the late Sir Hugh Lane, who was drowned in the sinking of the *Lusitania*, bid £10,000 at the first Red Cross sale in 1915 for a portrait to be painted by Mr. Sargeant. The executors of Sir Hugh Lane have now forwarded a cheque for the amount stated, but the sitter for the painting has not been nominated.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Accidentally Killed.

Capt. J. F. St. J. Annesley, R.A.M.C., was educated at Queen's College, Belfast, and qualified in 1888. He was in practice in Ireland before joining the R.A.M.C., and met his death through an accident to an aeroplane in which he was endeavouring to experience the effects of flying on the nerves.

Died of Wounds.

Capt. P. H. Burton, R.A.M.C., attached London Regt., was a student at the London Hospital and qualified in 1914.

Wounded.

Capt. C. A. R. Gatley, R.A.M.C., attached the Buffs.
Capt. D. J. S. Stephen, M.C., R.A.M.C.
Capt. R. B. Wallace, R.A.M.C., attached Leicester Regt.
Capt. H. G. Willis, R.A.M.C.
Capt. F. Harris, R.A.M.C.
Capt. A. C. Armstrong, Canadian A.M.C.
Capt. J. L. Stewart, M.C., R.A.M.C., attd. Gordon Highlanders.
Lieut. L. G. Fernie, R.A.M.C.
Capt. J. M. MacDonald, R.A.M.C.
Capt. T. C. Clarke, R.A.M.C.
Major J. W. Leitch, R.A.M.C.
Capt. J. M. Stalker, R.A.M.C., attached Royal Warw. Regt.
Capt. H. S. Sugars, R.A.M.C., attached West Yorks Regt.
Capt. R. A. S. Sunderland, R.A.M.C.
Capt. J. G. Brown, R.A.M.C., attached Royal Irish Fusiliers.
Capt. A. O. P. Reynolds, M.C., R.A.M.C., attached Devon R.
Capt. J. H. Brown, Australian A.M.C.

Missing.

Surgeon A. M. Russell, R.N.

Erratum.—Capt. J. Ewing, R.A.M.C., of Leeds, now temporarily stationed at Norwich, writes to say that he is not the same Capt. J. Ewing as was reported "Died of wounds" in THE LANCET of May 19th, 1917, p. 776. He reports that he is "as fit as the proverbial fiddle"—a condition upon which we congratulate the gallant member of our profession.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Capt. C. A. R. Gatley, R.A.M.C., attached the Buffs, son of Dr. H. R. Gatley, temporarily Assistant Medical Officer at Maidstone Asylum.
Capt. V. O. Todd, Royal Lancaster Regiment, second son of Col. O. Todd, A.M.S.
Capt. B. R. Poole, Canadian Army Veterinary Corps, youngest son of Surg.-Major G. K. Poole, of Upper Norwood.
Second Lieut. H. E. K. Eccles, Royal Flying Corps, eldest son of Dr. E. T. Eccles, of Hove, Sussex.
Lieut. P. H. G. Pye-Smith, Liverpool Regiment, only child of the late Dr. P. H. Pye-Smith, F.R.S.
Capt. A. H. Ardagh, Canadian Infantry, only son of Dr. A. P. Ardagh of Orillia, Ontario, Canada.
Second Lieut. M. W. A. Sandoe, Devonshire Regiment, eldest son of Dr. J. W. Sandoe of Broadclyst, Devon.

FOREIGN DECORATIONS.

Russian.

Order of St. George (4th Class).—Capt. J. A. Sinton, V.C., I.M.S.
Order of St. Anne (2nd Class, with Swords).—Lt.-Col. and Brev.-Col. J. M. Sloan, D.S.O., R.A.M.C.
Order of St. Stanislas (2nd Class, with Swords).—Lt.-Col. and Brev.-Col. M. H. G. Fell, R.A.M.C.

French.

Légion d'Honneur.—Croix de Chevalier: Maj. W. H. Tucker, I.M.S. *Croix de Guerre:* Capt. J. Angus, R.A.M.C., Lowland Field Amb.; Capt. O. Teichmann, R.A.M.C., attd. Worc. Yeo.; Maj. M. F. White, I.M.S.

THE UNITED STATES AND MEDICAL ORGANISATION FOR THE WAR.

Arrival in England of American Medical Contingents.—A contingent of medical men and nurses, ranking as a regular unit of the American Army has arrived in England on its way to France. The surgeons and nurses were received by the King last Wednesday, who welcomed them in the following speech :—

It is with the utmost pleasure and satisfaction that the Queen and I welcome you here to-day. We greet you as the first detachment of the American Army which has landed on our shores since your great Republic resolved to join in the world struggle for the ideals of civilisation. We deeply appreciate this prompt and generous response to our needs. It is characteristic of the humanity and chivalry which have ever been evinced by the American nation that the first assistance rendered to the Allies is in connexion with the profession of healing and the work of mercy.

The unit, which has a personnel of between two and three hundred, has been organised by, and is under the direction of, Professor G. W. Crile, the leader being Major Harry L. Gilchrist. In addition to the professional staff of 20 doctors and surgeons there are 65 nurses and three companies of orderlies. Harvard University has supplied 90 per cent. of the personnel, the remainder having been recruited from a number of other universities.

A second American medical contingent has now arrived in this country. It consists of 26 doctors, 60 nurses, and 250 orderlies.

Recent numbers of the *Journal of the American Medical Association* give an illuminating account of the administration of the Medical Department of the United States Army. The department is divided into the Medical Corps, Medical Reserve Corps, Nurse Corps, Dental Corps, Veterinary Corps, and the enlisted men of the Hospital Corps. After June 1st there will be in addition a Medical Officers Reserve Corps. The Medical Corps, which consists of commissioned officers, numbered 443 in June last, 150 additional officers having been placed on the roll since. The Defence Act of 1916 made provision for an additional 1000. In round numbers, each division of 20,000 men requires 100 medical officers for service with the division, in addition to those attached to hospitals in the rear. The Medical Reserve Corps is designed to furnish temporary medical officers for service with the Army in time of war, the numbers in June last being 1767 on the inactive list and 146 on the active list—i.e., men making good the shortage of officers in the regular corps, including those who took part in the recent concentration on the Mexican border. Previous to the formation of a reserve corps, contract surgeons were employed; but this plan was discarded as unsatisfactory to the Government as well as to the officers themselves. The Dental Corps, organised in 1911, consisted in June last of 40 regular dental surgeons and 35 acting dental surgeons. In the Spanish-American war a large number of volunteer nurses were employed; but the experience was not wholly satisfactory, and a Nurse Corps was organised in 1901, consisting of a superintendent, chief nurses, nurses, and reserve nurses and numbering at present 150 on the active list. The enrolled nurses of the American National Red Cross Nursing Service constitute the reserve of the Army Nurses' Corps. What are called the Sanitary Troops are employed for the care of the wounded and their transport to dressing stations, field and other hospitals. Between 5000 and 6000 men belong to the corps.

The Duties of Military Medical Officers.—The medical officers of the Army have duties similar to those of civilian life, opportunity being allowed for development in special branches of medicine or surgery. As a sanitary officer the medical man acts in an advisory capacity, reporting to his commanding officer, who has himself been instructed in sanitary matters and is in a position to appreciate the value of recommendations made to him. Examination of recruits is also part of the duties of the medical department, it being recognised that "it is of much more importance to obtain a small number of men physically effective than a large number of men liable to spend time in hospital and receive a pension on their discharge from the service." The medical officers deliver lectures to commissioned officers on personal and camp hygiene, while the men are instructed in personal hygiene and on the moral and physical aspects of venereal disease. Medical officers of the rank of major receive instruction in sanitary tactics. In time of war each divisional commander of 20,000 men has on his staff a medical officer of the rank of lieutenant-colonel, who is divisional surgeon with complete control of the medical department, and a sanitary inspector of corresponding rank under him. A new departure is the appointment of a divisional sanitary inspector who may be authorised by the divisional commander to remedy sanitary defects without reference to higher authority and without the delay "incident to the so-called 'red-tape' of the service."

OBITUARY OF THE WAR.

TOM WELSH, M.B., CH.B. EDIN.,

MILITARY CROSS;
CAPTAIN, SOUTH AFRICAN MEDICAL CORPS.

Captain T. Welsh, who was killed in action on April 13th, was younger son of the late James Welsh, of Edinburgh, and was educated at Merchiston School and Edinburgh University. Graduating in 1910, he filled resident medical and surgical posts at the Royal Infirmary, Edinburgh, and the Ramsgate General Hospital, afterwards going to South Africa as assistant medical officer to the Knight Central Mines at Johannesburg. He volunteered for service in the campaign against German South-West Africa, and in November, 1914, he accepted a commission as captain in the 1st South African Field Ambulance, being sent to Egypt for four months. Returning to France in April, 1916, he was mentioned in despatches after the fight at Delville Wood, and was awarded the Military Cross for conspicuous bravery at the Somme. "He displayed great courage and determination in organising and leading stretcher-parties under very heavy fire."



A medical friend writes of Captain Welsh: "Self-sacrifice and duty were the watchwords of his life, and in all he thought and did he was unselfish; he was always a joyous happy boy, simply because his honest and upright mind was far removed from evil. His life was sacrificed in an attempt to succour wounded men from a village which was being systematically shelled to the ground by the enemy. Tom Welsh leaves behind him keen regrets in the hearts of his friends."

JAMES RAE, M.A., M.D. ABERD.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant Rae, who was reported missing, believed drowned, on April 15th, on his way to Egypt on the troopship *Arcadian*, was second son of William Rae, advocate, of Aberdeen. He was educated at Aberdeen University and University College, London, taking his M.A. Aberd. in 1904 and qualifying in medicine in 1909. Two years later he took his doctorate with commendation, presenting a thesis on the Deaths of the Kings of England which afterwards appeared in book form, affording entertaining reading and containing an excellent bibliography. After holding resident appointments at the Children's Park Hospital, Hither Green, and the Selly Oak Infirmary, Birmingham, he joined the Royal Army Medical Corps and was appointed registrar to the Connaught Hospital, Aldershot. Whilst there he contributed to our columns an analysis of the Duration of Treatment in 1500 Cases, showing that return to duty occurred after an average of 28 days' treatment and at an average cost of £4 per man. Before sailing for Egypt he had been for a year resident surgeon at the 1st Birmingham War Hospital. Lieutenant Rae married in 1915 Alison B. Wells, youngest daughter of Thomas Wells, late of Edgbaston, Birmingham.



JOHN HENRY EDWARD AUSTIN, L.R.C.P. EDIN.,

COLONEL, ARMY MEDICAL SERVICE.

Colonel J. H. E. Austin, whose death took place in a military hospital in London on April 26th, was son of the late Rev. Edward Austin, of Rendlesham, Suffolk. He received his medical education at St. George's Hospital, London, qualifying in 1887, and joining the Royal Army Medical Corps four years later. He was specially promoted major for active service in the field in 1900, becoming lieutenant-colonel in 1912, and finally, in 1915, Colonel in the Army Medical Service.



In his earlier years he was stationed at Woolwich and was from 1893–96 in India, where he served at Belgaum, and afterwards at Mandalay and other places in Burma. In July, 1898, he was in Egypt with the Nile Expedition, receiving the British and Egyptian medals. He accompanied the 2nd Grenadier Guards to South Africa in 1900, serving with them during the greater part of the South African War, and was mentioned in despatches, receiving the Queen's medal with three clasps and the King's medal with two clasps. From 1902–6 he was at Singapore. In 1910 he was posted to the London District for recruiting duties, a subject in which he took considerable interest, shown by his contributions to the *Royal Army Medical Corps Journal* on the subject. He held the appointment of Medical Inspector of Recruits in Scotland until he proceeded to France with the Expeditionary Force in August, 1914. He subsequently went to Egypt in charge of a general hospital, and was invalided home from that country in September, 1915, his death occurring after an illness of several months' duration. Colonel Austin's death will be deeply regretted by a large circle of brother officers and friends.

JAMES ALFRED GREGORY, M.R.C.S. ENG.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant J. A. Gregory, who died of wounds received in France on April 13th, at the age of 26, was only son of Mr. R. Gregory, of Standish, Lancs. He was educated at the Manchester Grammar School, and studied medicine at Manchester University, qualifying in 1914, when he became house surgeon to the Evelina Hospital for Children. In June, 1916, he obtained a commission in the R.A.M.C., going out to France in the following November. He was wounded by a shell as he was taking part in an advance with the regiment to which he was attached, only surviving his injuries for a few hours. His reputation with his superior officers was that of a man always cheery and thorough in his work, even under the most trying conditions. Lieutenant Gregory was recently married to Mollie Waddington, formerly of Wigan, Lancs.



Correspondence.

"Audi alteram partem."

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—The articles and correspondence dealing with the Lumleian Lectures and Soldier's Heart that have recently appeared in THE LANCET have interested me, not only on account of the subjects themselves but because they throw a light upon a much wider aspect of medical science. True science is always progressive, and medical science fortunately can show progress, though at times it may be timorous and halting. At uncertain periods new ideas arise, or perhaps it would be better to say modifications of old ideas, for it is often difficult to trace the origin of any new idea. One man may get an idea from another and apply it in a different manner, and it may have a more fruitful result in its newer application. So when I speak of newer conceptions I mean it with this limitation.

I wish to show how the newer conception of investigation in clinical medicine differs from the conception of the past. The two different conceptions are excellently illustrated by the recent contributions to THE LANCET. We have, on the one hand, the results of the newer methods given in some detail, and we have representatives of the older school criticising them. We see in this little arena the characteristics of the warfare between progress and reaction carried on as it is in all the ages and in every sphere of human thought. The reactionary calling attention to the wisdom of the past, angry and indignant, but unable to comprehend the significance of the change that has come over the scene. The time will come when what I refer to now as the new conception will in its turn be replaced by other views.

Though the two opposing views have a bearing on the whole field of clinical medicine, the particular field of cardiology serves to illustrate the differences in a manner easily demonstrated. Clinical medicine up till now has dealt mainly with the later stages of disease, seeking for physical signs of disease, and the changes in the tissues after the disease has damaged the organism. This, of course, was a necessary stage in the advance in medicine, and it has given us facts sound and solid which we can use as steps to further knowledge. But having gone so far there has come a period when the field is nearly exhausted, and the necessity arises for a new conception if progress is to continue. At this stage some wish to progress one way and some another, and a good deal of confusion arises. Many eminent clinicians have looked around and have stated that no progress can be made until new instrumental methods are discovered and they look to the laboratory workers for assistance. If we look at recent books on diagnosis we shall find practically no advance in the last 30 or 40 years save for some new laboratory methods.

There has, however, gradually taken shape a conception of research in clinical medicine which can show a distinct advance, and though aided by instrumental methods, yet the more important observations have been discovered without accessory aids. This advance has been due to a fuller appreciation of the importance of symptoms and has necessitated the more accurate investigation into the sensations of the patient, and into the mechanism by which sensations and objective signs are produced, and the effect the cause of the symptoms has upon the health of the patient. This has required the patient observation of individual cases for long periods in order to note the progress of the disease and the careful recognition of all associated signs and symptoms.

Many people reading of the results of these methods will scoff and say that there is nothing new in them, that they had been pursued for years. If, however, we appreciate the mental attitude of your correspondents towards the recent researches in cardiology, the difference in the points of view will be realised.

We have Dr. F. J. Smith criticising—*more suo*—the Lumleian lecturer, as he criticised me some years ago on the supposition that I did not know that Sir A. Clark had taught that murmurs may have no significance. I was perfectly aware of Clark's views. I remember reading his address at the Brighton meeting of the British Medical Association in 1886 when he set them forth. They were to this effect: A great many people's hearts showed murmurs in whom heart failure, as he conceived it, did not arise. Now the fact that murmurs may be of little or no significance has long been recognised, but what Sir A. Clark failed to do, and what most other writers failed to do, was *how to assess the value of a murmur and to differentiate the murmurs that are of significance from murmurs that are of no significance.* There is a belief held by many that this differentiation has been achieved. Thus in his letter to THE LANCET Dr. A. Morison states that negligible cardiac bruits are usually easily diagnosed and have frequently been fully appreciated. Would he tell us where? He is a voluminous writer on cardiac matters. Will he point out a single instance where he has given with clearness and precision a description of how murmurs can be differentiated to show those that are innocent and negligible from those that imply danger? Would he also tell us where in his own writings, or in the writings of others, the principles for assessing the value of murmurs are indicated? His remarks, so far as I have read them, are of that oracular type from which any conclusion can be drawn, and full of that vague warning that danger may lurk, but where it lurks he never tells. If he would favour us with the information so that a reader of average intelligence could understand he would confer a benefit on mankind.

The assumption of a knowledge where there is no real knowledge is also evident in connexion with irregular heart action. Dr. Smith seriously tells us: "of irregularity and its effect or lack of effects, clinically, Clark and Sutton knew as much as we do now." If Dr. Smith means himself and men of his way of thinking he is probably right. This unjustifiable assumption of knowledge is typical of the older school. I remember about 20 years ago, when I was studying heart irregularities and had got a basis for differentiating some of them on physiological lines, I was engaged in working out their clinical significance. At that time there was advertised the forthcoming publication of a cyclopædia of medicine to which the leading English physicians were to contribute. I looked eagerly for the publication of the heart volume, for at that time I had no doubt that the great London physicians would be able to remove my keenly felt ignorance. Judge of my surprise when I got the volume to find that save for some incidental references the matter of heart irregularity was ignored. Considering the extraordinary frequency of irregular hearts among my patients, its association with health and varying degrees of ill-health, I was astonished, and so had the temerity to write a letter to the very distinguished physician who edited the cyclopædia, and who had himself contributed some of the heart articles, calling attention to the omission. Seeing what we now know of the great importance of a knowledge of irregular heart action, I always smile when I remember his reply, which was to this effect: "The significance of irregular heart action is a matter of common knowledge, and being so well known it was not considered necessary to deal with it in the cyclopædia." Is not this a delightful illustration of the academic mind, "What I don't know is not knowledge"!

It cannot be too strongly emphasised that our knowledge of the significance of murmurs is still wofully deficient. I have tried, indeed, to solve the problem, as others have done before me, but our united efforts still leave a great deal to be done. The lack of success has been in a great measure due to the fact that we do not possess the knowledge to enable us to interpret the significance of the signs. To ascertain the significance of murmurs actually caused by a valve defect we must know the life-history of the individual. Thus we must watch individual cases during the illness which caused the damage, we must watch him for the remainder of his life and note the gradual changes that ensue if the damaged valve leads to heart failure. We must realise wherein the danger lies—as, for instance, that the danger is really caused not by the damaged valve but by the heart muscle not being able to overcome successfully the embarrassment to its work caused by the damaged valve. This, then, calls for the recognition of the signs and symptoms evoked by the embarrassed muscle. These are extremely elusive and varied, as they include alterations in

the size and shape of the organ, variations in the rhythm and rate of the heart; while the impairment of the efficiency of the organ may be manifested in the altered function of other organs. Many of these phenomena have not yet been accurately recognised, and it is towards their elucidation that the more recent investigations are directed.

To illustrate the necessity for this line of research one has but to point out how limited is our knowledge of such well-marked murmurs as the presystolic mitral murmur and the aortic diastolic murmur. I have followed the above line of investigation in regard to the former and have dimly perceived the factors that enable me to assess the value of this murmur, but I am far from asserting that I have succeeded in completely solving the problem. I have attempted the solution of aortic regurgitation, but must confess myself baffled in accounting for the heart failure in many of these cases. I have seen the heart failure fatally precipitated by the onset of an abnormal rhythm as auricular fibrillation or auricular flutter, but there are many cases where heart failure sets suddenly in, without the occurrence of an abnormal rhythm, in a manner characteristic of no other condition. I am distinctly of opinion that in aortic regurgitation there occurs something in the heart peculiar to this condition which I cannot link up with the heart failure arising in other conditions. It will thus be seen that though we have made a little advance in our attempts to assess the value of murmurs much has yet to be done, and that those who fancy they know all about the matter imagine a vain thing.

Another great field of research that lies practically unexplored is the action of remedies. It is a curious fact that there is not a single drug employed by the profession whose action in the human body has been accurately observed. I know this statement will be strongly disputed, but I have only to point out how lamentably ignorant we are of the action of cardiac remedies to show the truth of the statement. I suppose there is no drug during the past 150 years that has been the subject of so much discussion as digitalis. Thousands of physicians have lectured upon its effects and numerous physiologists and pharmacologists have experimented with it, yet they have missed the fundamental principles governing its action. Some years ago I collected the records of all the cases to whom I had given digitalis for 10 years. When I analysed the results I was struck by the varied reaction to the drug. Many of these reactions were a puzzle to me, but continuing the investigation the matter gradually became clearer, and I found that the reaction in a great many cases varied with the nature of the disease present in the heart. Thus in one case heart-block would be produced, in another extra-systoles, in another auricular fibrillation, while in a great many the digitalis, though pushed to the furthest limits, seemed to have no effect upon the heart. Moreover, hearts affected by an abnormal rhythm responded differently; thus cases, with what now we know as auricular fibrillation, responded in one way, while others with auricular flutter reacted in another way.

To help to solve these peculiarities I searched diligently the literature, beginning with the original articles of Withering published in 1785. I searched the literature in the English, French, and German languages, and in the whole of this literature there was not recorded a single case where the condition of the heart was clearly detailed, and the reaction intelligently described. I mention this not to reflect upon the intelligence of the physicians of the past, but to show the necessity for a new conception in clinical investigation. This will be appreciated if I state briefly two main reasons for the failure of the past observers to find out the action of digitalis on the human heart. First, physicians were unable to recognise its effect because medical science had not advanced so far as to enable them to diagnose the heart condition, nor the abnormal rhythms which modified the action of digitalis. Second, experimentalists failed because they did not know that digitalis reacted according to the nature of the lesion with which the heart was affected, but assumed that the reaction they got in the healthy hearts of animals would be the same in the diseased human heart.

The true conception of clinical investigation should be to make the recognition of a new fact a step to further knowledge. This is, of course, recognised in theory, but it is not always put in practice. We have seen this in regard to Sir A. Clark's attitude to murmurs, and we see it in your correspondent, Dr. Poynton's, attitude to the discovery of the rheumatic microbe. It is now many years since he announced his discovery, and so far as I know he has done nothing with the discovery but to repeat the announcement. When I was a student, nearly 40 years ago, people were describing the discovery of the rheumatic microbe, and others have done the same thing since; but from that day to this no sufferers from rheumatic fever have derived the slightest benefit from the discovery, nor has the discovery added anything to our clinical knowledge. In place of being content with the announcement of the discovery, investigators should carry the matter further by studying out the life-history of the microbe—how it gets entry into the body, the signs of its earliest invasion, and how these signs differ from the effects of other morbific agents, its susceptibility to remedies, &c. Such are some of the lines that Dr. Poynton might have pursued. This instance illustrates the attitude of much bacteriological discovery; as many people, having recognised a microbe, do not know what to do with their discovery.

If I have succeeded in making my point clear, the need for a new conception in the investigation of disease will be realised. The conception I am advocating is not limited to the investigations of the circulatory system, but the principle must be applied to the symptoms produced by every organ in the body. This principle involves the careful perception of every symptom, subjective as well as objective, an investigation to find out the mechanism of its production, and the bearing that the cause of the symptom has on the individual's life-history. We have greatly benefited by the laborious and careful histological examination of the tissues in health and disease, we must now turn our attention to an equally careful investigation of the symptoms of disease. The methods employed differ widely, and as no trouble is spared to make a competent microscopist, no trouble should be spared to make a competent clinical observer.

In thus insisting upon new methods for clinical investigation it is not necessary to reflect in any way upon the older physicians. They did their work according to their lights, and we do ours according to our lights. The time will come when other ideas will supersede ours, and we must rejoice thereat, as it will be for the advance of knowledge. Nor must we neglect the investigators of the past, for the work they have done is invaluable, and if to-day we can make some progress it is because they have prepared the way. I am conscious of a great debt of gratitude which I owe to the great physicians of the past. I have been an earnest student of the writers of the past, Morgagni, John Hunter, Wilkinson King, Stokes, and the more recent writers, as Gairdner, Sutton, Broadbent, Balfour. I have a fairly comprehensive knowledge of the literature dealing with the circulatory system, and I am convinced that in no other language are the writers superior to those of these islands for breadth of outlook, philosophic thought, and sanity of judgment. It is ever a pleasure and an instruction to turn to the writings of the world's greatest clinical investigator, John Hunter. If anyone wishes to understand what clinical investigation is let him study the writings of this remarkable man, and then let him visit the College of Surgeons Museum, and if good fortune attends him get a chat with Arthur Keith.

I am, Sir, yours faithfully,

May 15th, 1917. J. MACKENZIE.

A RAPID METHOD OF OBTAINING ANAEROBIC SPORE-BEARERS IN PURE CULTURE.

To the Editor of THE LANCET.

SIR,—In your issue of May 12th Captain W. J. Wilson describes an easy method of obtaining plate cultures of anaerobes. As Miss Muriel Robertson suggests, however, in the *Journal of Pathology and Bacteriology*, and again in her letter to THE LANCET of May 19th, this is only the beginning of difficulties. Before proceeding to investigate a particular variety of spore-bearer isolated by the plate method it is of the utmost importance to determine its purity. That laboratory strains of *B. tetani*, hitherto regarded as pure, should, as Miss Robertson indicates, turn out to be a symbiotic mixture is further evidence of the need for the most careful verification of the purity of the organism as a preliminary to further work.

It is obvious that the usual laboratory method of repeated plating is not reliable. The ideal method would, of course,

be to raise a culture from a single cell. Such a method was introduced by Burri in which Indian ink is used as a dark ground for the bacteria. This particular method, however, is open to certain objections, one of which is the risk of contamination owing to the necessary exposure of the glass slips. Moreover, such a method demands considerable time and skill, the latter of which is not acquired in a day. Where time is a matter of some moment I would suggest the following alternative:—

An isolated colony or part of such a colony is picked off from the solid medium with a platinum needle, and a suspension of this material is made in one or two c.c. of sterile saline. An old colony is perhaps preferable where there is practically nothing left but spores. After vigorous shaking a sample of this suspension is transferred to a hæmocytometer stage, or preferably to a counting chamber such as has been devised by Professor Ernest Glynn for the numerical estimation of bacteria in vaccines. Having ascertained the number of spores or bacilli per c.c. in the suspension, it is an easy matter to make from this a dilution which will contain approximately one spore or one bacillus per unit of saline. When the desired dilution has been obtained, it is an easy matter to sow a series of meat or Hirnbrei tubes each with the unit volume of saline containing a single organism or spore. These are then incubated anaerobically, and thereafter examined as to their purity. If a sufficiently high dilution has been made there is every probability that a pure strain or strains will be secured.

The method is simple, does not take up much time, reduces the possibility of extraneous contamination to a minimum, and, short of raising a culture from a guaranteed single bacillus, as the ideal method would be, offers a very reasonable prospect of success.

I am, Sir, yours faithfully,

ROBERT DONALDSON,
Pathologist, Royal Berks Hospital.

Reading, May 20th, 1917.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

To the Editor of THE LANCET.

SIR,—In spite of the fact that a circular has been issued stating that the "National Committee for Relief in Belgium" is ceasing to take part in the relief of the suffering in Belgium, this Committee (The Belgian Doctors' and Pharmacists' Relief Fund), as the result of a letter received from "The Commission for Relief in Belgium," has decided to continue to send £800 a month to the Committee in Brussels. The letter contained the following words:—

"Every arrangement has been made to assure that the relief shall go on without interruption. Spanish and Dutch representatives will take the place of the Americans, and the actual handling of the relief cargoes, the distribution of money, &c., will be supervised by Belgian representatives of the Commission in a way which we feel confident will ensure the food and funds arriving at their proper destination. ..... I therefore hope that you will be able to continue the ..... contributions from your society as in the past. They have afforded great relief."

I am, Sir, yours faithfully,

H. A. DES VŒUX,
Honorary Treasurer.

14, Buckingham-gate, London, S.W. 1, May 23rd, 1917.

THE EXAMINATION OF THE BLOOD OF TYPHUS FEVER CASES BY DARK-GROUND ILLUMINATION.

To the Editor of THE LANCET.

SIR,—A few days after the publication of the letter sent to you by Dr. Georgina Darling and myself,[1] the examination of a large number of "controls" demonstrated that the spirochæte-like bodies found in the blood of typhus fever cases were also present in the blood of other patients, and even in that of healthy subjects. I am therefore in entire agreement with the remarks of Lieutenant-Colonel L. W. Harrison, R.A.M.C., in his letter of April 29th. I think Colonel Harrison has done good service in describing these "streamers," and in this way preventing others being deceived by them. I would have written earlier, but my sudden departure overseas prevented me.

I am, Sir, yours faithfully,

W. JAMES WILSON,
Captain, R.A.M.C. (T.F.).

B.E.F., May 20th, 1917.

[1] THE LANCET, April 14th, 1917, p. 569.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Appeal Pensions Tribunal.

THE two medical representatives on the tribunal which is to hear appeals from decisions awarding gratuities to sailors and soldiers discharged as medically unfit are Mr. BILTON POLLARD, of the Royal College of Surgeons, and Dr. NORMAN MOORE, of the Royal College of Physicians.

HOUSE OF COMMONS.

WEDNESDAY, MAY 16TH.

Medical Re-examinations.

Answering Mr. NEEDHAM, Mr. MACPHERSON (Under Secretary for War) said: Owing to the very great pressure on the medical boards it is impossible to set up at present a system of anticipatory medical examinations in connexion with the Military Service (Review of Exceptions) Act. It is hoped, however, as soon as may be, to afford facilities for men who desire to be medically examined in advance of the date on which, under the Act, they would be liable to be called up for re-examination, and where under such authorised anticipatory medical examination a man is found to be permanently and totally disabled for military service he will receive a final discharge in accordance with the provisions of the Act.

In reply to Mr. PENNEFATHER, Mr. MACPHERSON said: The Military Service (Review of Exceptions) Act, 1917, expressly defines the limits within which notices requiring re-examination are sent to discharged sailors and soldiers. In order to avoid error, the form of notice bears on the face of it a statement that it does not apply to any officer or man who has left or been discharged from the naval or military service of the Crown in consequence of disablement, if the disablement has been certified under the authority of the Admiralty or of the Army Council to be the result of wounds, including injury from poisonous gas, received in battle or in any engagement with the enemy or otherwise from the enemy, or in consequence of neurasthenia or any allied functional nerve disease, if so certified by a special medical board to be the result of naval or military service in the present war. For a man who considers that he falls within this exclusion a form of claim is printed on the back of the notice, which is to be returned to the recruiting officer in order that inquiries may be made.

THURSDAY, MAY 17TH.

Medical Examination of Female Prisoners.

Commander WEDGWOOD asked the Home Secretary what further steps had been taken in investigation of the Brentford case; and whether the magistrate who ordered the medical examination of two innocent women was still administering justice in the Brentford district.—Sir GEORGE CAVE replied: I have made inquiries into this case, and am informed that the magistrates did not order an examination of the two women referred to. The women were charged with disorderly behaviour, and the magistrates, after hearing part of the evidence, remanded them for inquiries, and endorsed upon the committal order a statement that the justices would be obliged by the opinion of the medical officer as to whether the women were suffering from disease. I have informed the magistrates that in my opinion this request should not have been made. In consequence of the magistrates' request the two women were medically examined at Holloway Prison, with the result that they were reported by the deputy medical officer to be free from disease. The prison medical officers have definite instructions that no woman is to be examined without her consent, and I am assured that in this case the necessary consents were obtained. On the hearing of the case being resumed, the magistrates dismissed the charge. It appears from the information given to me that no illegality was committed, but I desire to repeat that in my opinion there was no reason whatever why the magistrates should have asked for any opinion from the medical officer and I regret that the request was made.

Mr. LEIF JONES: Are prisoners made aware that they may refuse their consent to such examination?—Sir GEORGE CAVE: I understand that they are always told they may refuse.

Prisoners and Venereal Disease.

Answering Commander WEDGWOOD, who asked whether in a certain prison girls due for discharge were obliged to submit to a medical examination, and if found suffering from venereal disease were detained beyond their sentence, Sir GEORGE CAVE said: Under Statutory Rule 11 all prisoners must be examined before discharge. No prisoner is locally examined for venereal disease without consent. No prisoner

can legally be detained beyond the expiration of sentence and no prisoners are or have been so detained.

MONDAY, MAY 21ST.

Committee of Reference under Military Service Act.

Sir WILLIAM COLLINS asked the Under Secretary for War who were the members of the Committee of Reference of the Royal College of Physicians of London and the Royal College of Surgeons of England; whether it was appointed under Section 7 of the Military Service Act, 1916 (Session 2); by whom its members were selected; and with what powers and duties it had been entrusted.—Mr. MACPHERSON wrote in reply: The Committee of Reference is composed of the following: the chairman is the President of the Royal College of Physicians, and the members are four Fellows of the Royal College of Physicians, with the President and four Fellows of the Royal College of Surgeons. This committee was appointed under Section 7 of the Military Service Act, 1916 (Session 2), and the Military Service (Professional Committees Regulation) Order, 1916, as the Committee of Reference for Section 5 of these Regulations. The members were appointed by the Royal Colleges of Physicians and Surgeons and approved by the Army Council. Their powers and duties are contained in the Regulations mentioned.

Medical Students.

Mr. T. E. HARVEY asked the Under Secretary for War whether any further steps were to be taken to recall from the ranks medical students now serving in the Army with a view to their employment in medical and surgical work; and whether, in view of the need for additional doctors and surgeons, arrangements could be made for the employment of advanced medical students in responsible work in the Royal Army Medical Corps and military hospitals similar to that of surgeon probationers in the Navy.—Mr. MACPHERSON answered: Fourth and fifth years' students can be released, if serving, to continue their studies. Their employment with the Army is not considered desirable, as it is thought better to wait until they can be commissioned as medical officers.

Military Hospital Huts at Cromarty.

Mr. MORTON asked the Under Secretary for War whether any of the military hospital huts at Cromarty were to be used as a hospital for the treatment of venereal disease; and, if so, would he have the matter fully inquired into and further considered before anything of the sort was allowed.—Mr. MACPHERSON replied: This matter is now being considered.

Voluntary Aid Hospitals.

Sir WILLIAM COLLINS asked the Financial Secretary to the War Office whether any, and if any what, grants were made to voluntary aid hospitals in respect of medical services rendered by civilian medical men, and what were the conditions regulating any such grants.—Mr. FORSTER wrote in reply: Very large numbers of civilian medical men have rendered, and are rendering, such services gratuitously, and services so rendered the War Office gratefully receives. If a civilian doctor in the exercise of his own discretion sees fit to claim payment for his services, the General Officer Commanding has power under the War Office instructions to allow suitable remuneration, having in view the circumstances of each case, and in that case the grant to the hospital in question is increased by an equivalent amount.

WEDNESDAY, MAY 23RD.

Promotions in the R.A.M.C. (Territorial Force).

Mr. LYNCH asked the Under Secretary for War (1) whether, notwithstanding that a field ambulance of the Territorial Forces was a definite unit even in peace time and its establishment was laid down as consisting of a lieutenant-colonel, two majors, and others, promotions to these posts were being withheld for long periods although suitable men were recommended for them, and, if so, whether this state of affairs would be remedied; (2) whether vacancies on the medical staffs of field ambulances of the Territorial Forces were frequently filled by promoting officers of the Royal Army Medical Corps (Regular Forces), to the exclusion of Territorial officers of longer service, notwithstanding that such officers had been recommended for promotion by their commanding officers; and whether, in fairness to medical men who gave their services to the Territorial Force before the war, promotions would be regulated by considerations of merit and of work performed; and (3) whether all applications for promotion made on behalf of medical officers of the Territorial Forces who joined prior to the outbreak of war were now refused on the plea that promotions in the Royal Army Medical Corps were in abeyance; and whether steps would be taken to facilitate promotions which had been earned by long and faithful service.—Mr. MACPHERSON replied: It is not the fact that all promotions in the Royal Army Medical Corps (Territorial Force) are refused on the grounds stated. When suitable officers with the requisite qualifications, service, and experience are available, promotions are made. Only when such officers are not available for command are regular or temporary officers of the Royal Army Medical Corps brought in. Promotion in the Royal Army Medical Corps (Territorial Force) is now under consideration by the committee of which the Member for Dundee (Mr. Churchill) is chairman.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

BRADBURNE, A. A., F.R.C.S. Eng., has been appointed Honorary Ophthalmic Surgeon to the Victoria Memorial Hospital, Manchester.

LLOYD, E. LEWYS, County Medical Officer of Health and School Medical Officer for Merioneth.

MCKINNEY, W. B., Medical Officer of Lisnaskea Dispensary District and Union Hospital *pro tem.*

NORMAN, HUBERT J., M.B., Ch.B. Edin., D.P.H., Lecturer on Mental Diseases at the Westminster Hospital.

To be Certifying Surgeons under the Factory and Workshop Acts: DYSON, P. A. S., L.R.C.P. Lond., M.R.C.S. (Grosmont District of the county of Yorks, North Riding); JAMES, S., L.R.C.P. Lond., M.R.C.S. (Brynamman District of the county of Carmarthen); JONES, R. F., L.R.C.P. Lond., M.R.C.S. (Tamworth District of the county of Stafford); O'CLERY, L., M.D., M.Ch. R.U.I. (Clonakilty District of the county of Cork).

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

ANGLO-RUSSIAN HOSPITALS.—Surgeons.

BETHNAL GREEN, METROPOLITAN BOROUGH OF.—Female Assistant Medical Officer of Health. Salary £350 per annum.

BIRMINGHAM CITY EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £300 per annum.

BRISTOL GENERAL HOSPITAL.—Casualty House Surgeon. Salary at rate of £175 per annum, with board, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Physician. Salary £150 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURNLEY, VICTORIA HOSPITAL.—House Surgeon. Salary £160 per annum, with board, &c.

CAPE TOWN, SOUTH AFRICAN COLLEGE.—Professors of Pharmacology, Pathology, and Bacteriology. Salary at rate of £800 per annum, each.

CARDIFF, KING EDWARD VII.'S HOSPITAL.—House Surgeon for six months. Salary at rate of £175 per annum, with board, &c.

CHARING CROSS HOSPITAL, W.C.—Honorary Anæsthetist.

CHESTER ROYAL INFIRMARY.—Assistant House Surgeon. Salary £150 per annum, with board, &c.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

EDINBURGH ROYAL ASYLUM, Morningside.—Temporary Assistant Physician. Salary £365 per annum, with board, &c.

EVELINA HOSPITAL FOR CHILDREN, Southwark, S.E.—House Physician for four months. Salary at rate of £160 per annum, with board, &c.

GRIMSBY AND DISTRICT HOSPITAL.—House Surgeon. Salary £5 5*s.* per week, with board, &c.

ITALIAN HOSPITAL, Queen-square, London, W.C.—House Surgeon for six months. Salary £80 per annum, with board, &c.

LABORATORIES OF PATHOLOGY AND PUBLIC HEALTH, 38, New Cavendish-street, W.—Bacteriologist.

LANCASTER COUNTY ASYLUM.—Temporary Assistant Medical Officer. Salary 7 guineas per week, with board, &c.

LEEDS PUBLIC DISPENSARY.—Resident Medical Officer. Salary £200 per annum, with board, &c.

LEICESTER EDUCATION COMMITTEE.—Two Assistant School Medical Officers (Temporary). Salary £300 per annum.

MANCHESTER, ANCOATS HOSPITAL.—House Physician. Salary £200 per annum, with board, &c.

MANCHESTER, BAGULEY SANATORIUM FOR TUBERCULOSIS.—First Assistant Medical Officer, unmarried. Salary £400 per annum, with board, &c.

NEWCASTLE-UPON-TYNE, ROYAL VICTORIA INFIRMARY.—Resident Medical Officer. Salary as arranged, with board, &c.,

NEW HOSPITAL FOR WOMEN, Euston-road, N.W.—Female Assistant Physician and Assistant Surgeon. Also House Physician, Obstetric Assistant. Two House Surgeons, salary £50 per annum, with board, &c. Also Resident Medical Officer at House of Recovery, New Barnet. Salary £60 per annum.

NOTTS EDUCATION COMMITTEE.—Assistant School Medical Officer. Salary £350 per annum.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—District Resident Medical Officer for four months. Salary at rate of £60 per annum, with board, &c. Also Pathologist and Registrar. Salary at rate of £80 per annum, with lunch.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.—Casualty Officer.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—Temporary Assistant Physicians on Monday and Wednesday afternoons and Wednesday mornings for Out-patient Work. Salary £25 per annum, with lunch. Also House Physician, Casualty House Surgeon, and House Surgeon for six months. Salary £100 per annum, with board, &c.

ST. BARTHOLOMEW'S HOSPITAL, SPECIAL DEPARTMENT FOR THE DIAGNOSIS AND TREATMENT OF VENEREAL DISEASES.—Chief Assistant. Salary £500 per annum.

ST. HELENS COUNTY BOROUGH.—Temporary Assistant Medical Officer of Health. Salary £350 per annum.

SHEFFIELD, JESSOP HOSPITAL FOR WOMEN, GYNÆCOLOGICAL AND MATERNITY DEPARTMENTS.—Junior Female House Surgeon, unmarried. Salary £200 per annum, with board, &c.

SHEFFIELD ROYAL HOSPITAL.—Casualty Officer. Salary £130 per annum. Assistant House Surgeon. Salary £120 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SOUTH LONDON HOSPITAL FOR WOMEN, South Side, Clapham Common, S.W.—Female House Surgeon for six months. Salary at rate of £100 per annum, with board, &c.

STOCKPORT, COUNTY BOROUGH EDUCATION COMMITTEE.—School Medical Officer. Salary £300 per annum.

SWANSEA EDUCATION COMMITTEE.—Female Assistant School Medical Officer. Salary £300 per annum.

TAUNTON AND SOMERSET HOSPITAL.—Senior House Surgeon. Salary £250 per annum, with board, &c.

WORCESTER, KING EDWARD VII. MEMORIAL SANATORIUM, Knightwick, near Worcester.—Temporary Medical Superintendent and Tuberculosis Officer. Salary £450 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Cavan and at Totnes.

Births, Marriages, and Deaths.

BIRTHS.

ALTOUNYAN.—On May 16th, at High-street, Hampstead, the wife of Lieut. E. H. R. Altounyan, R.A.M.C.—a daughter.

BAILEY.—On May 21st, at Bracondale, Stockport, the wife of Lieutenant J. T. Bailey, R.A.M.C., of a daughter.

HAYDON.—At St. Denys, 52, Hermitage-lane, Platt's-lane, Hampstead, the wife of Arthur Haydon, M.D., F.R.G.S., of a son.

HOLROYDE.—On May 17th, at Barnsley, Yorks, the wife of Douglas Holroyde, M.A., M.B., B.C., of a son.

LANDMAN.—On May 15th, at The Towers, Roundhay, Leeds, the wife of Dr. Julian Landman, of a daughter.

MCKAY.—On the 9th instant, at Streatham, to Annie and Robert McKay—a son.

POWELL.—On May 12th, at a nursing home, Sheffield, the wife of Ievan Herbert Powell, M.B., Ch.B. Dub., of a son.

RIDDOCH.—On May 15th, at Devonshire-street, W., the wife of George Riddoch, M.D, R.A.M.C., of a son.

MARRIAGES.

FRASER—CHARD.—On May 15th, at Chichester, Major Alexander Edward Gordon Fraser, R.A.M.C., to Dorothy Louise Josephine, elder daughter of the late R. A. S. Chard, of Magnolia, West Tarring, Worthing.

JONES—FREEMAN.—On May 12th, at St. Peter's, Chertsey, Captain Arthur Beresford Jones, R.A.M.C., to Evelyn A., youngest daughter of Mr. and Mrs. Herbert L. Freeman, Burwood House, Chertsey.

NASMYTH—MAUDE.—On April 19th, at Salonica, Lieutenant Hugh Nasmyth, A.S.C., to Dorothea C. Maude, M.D.

SHAW—WILLANS.—On May 18th, at St. Mary's Church, Bedford, Captain Townsend Shaw (late I.M.S.), R.A.M.C., to Eva Jeune, daughter of the late Dr. W. B. Willans, Much Hadham, Herts, and of Mrs. Willans, Woburn-road, Bedford.

DEATHS.

BREW.—On May 16th, at his residence, Chew Magna, Bristol, Richard Hugh Brew, L.R.C.P. & S. Edin., aged 55.

BURTON.—On May 12th, of wounds received in action the same day, Percy Herbert Burton, M.R.C.S., L.R.C.P. (London Hospital), Captain, R.A.M.C., attached London Regiment, in his 50th year.

KIND.—On May 3rd, from gas poisoning in action, Robert Gordon Kind, R.A.M.C., aged 28.

LE PAGE.—On Sunday, May 13th, 1917, at Millmount, Guernsey, Dr. Wm. Le Page, L.R.C.P., L.F.P.S., L.S.A., aged 75 years.

PHILBRICK.—On May 14th, in India, John Harold Philbrick, M.B. Cantab., aged 42.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Professor W. J. R. Simpson, C.M.G., has been appointed Chief Medical Officer to the Serbian Relief Fund hospital unit.

CHILDREN'S HOSPITAL FOR HIP DISEASE, SEVENOAKS.—As a memorial to the late Miss Emily Jackson, who founded the Children's Hospital for Hip Disease, Sevenoaks, a fund has been started for the purpose of purchasing a piece of land adjacent to the hospital. Donations should be sent to the honorary treasurers.

Notes, Short Comments, and Answers to Correspondents.

MEDICAL MEN DURING BURNAND'S EARLIER PERIOD ON *PUNCH*.

STUDENTS of medical history are doubtless familiar with *Punch's* treatment of the theme of medical men. These from early days in all countries have been subjects of satire, but *Punch* was perhaps the first satirist to begin showing them a certain respect. Under the editorship of the late Sir Francis Burnand, which began in 1880 and covered most of the Keene and Du Maurier period, we get a change in *Punch's* treatment of what is popularly called "the doctor." In December, 1880, Du Maurier's drawing appeared of the senior surgeon being warned by the nurse, who, with uplifted forefinger, exclaims, "You cannot enter now, Sir George. We are just going to have evensong!" The picture of the eminent surgeon is admirable and complimentary, and our sympathies are with him in a difficulty which might occur to-day. Earlier in the same year, when Tom Taylor was perhaps still editor, the medical jokes are of the old type—not ill-natured, that is to say, but not exactly eulogistic of the profession. Even in the same number of *Punch* (Dec. 18th) there is an Irish medical referee, also drawn by Du Maurier, who talks with a broad brogue and humorously refuses to pass a candidate for a policy on the ground that he owns land in Ireland. In October of the same year two monthly nurses, drawn by Charles Keene, are discussing a baby. "'Well, Nuss,' sez he, 'igh and 'orty like, he sez, 'Wot do you think?' sez he. 'Doctor,' I sez, quite differential, I sez, 'I'm quite of your opinion,' I sez. 'And I'm of the same way of thinking, Nuss,' sez he. And so we settles it." And the Professional Friend, the other monthly nurse, asks with much interest, "Lor'! and wot was his opinion, now?" "Bless yer 'art, my dear Creetur, in course *he never hadn't given none!*" Another of Charles Keene's admirably drawn medical sketches depicts the doctor being told by an old lady, to whom he had spoken about the advisability of tapping, "Oh, Doctor, don't say that! Nothing was ever tapped in this house that lasted over a week!!" The doctor here is depicted as a rather stodgy old individual. In March Keene draws a genial absurd elderly gentleman, who is waving his hat to an equally absurd old lady of the period. "My dear Madam," says the medical gentleman, "always live on gravel." But the old lady is sure she could not digest it.

Going backwards a few years, we find a joke not quite creditable to the profession, although genial in the manner of the time. Charles Keene depicts Dr. Jolliboy, "who had been called away from a social meeting at his club," in the act of feeling an old gentleman's pulse. "Thirteen, fourteen, f'fteen-two, f'fteen-four, f'fteen-six—pair eight—nob'sh nine," says Dr. Jolliboy, and then "drops off," and Mr. Punch draws a veil, &c. This is in the *Punch's Almanack* for 1874. In November, 1875, a "Struggling Young Physician," well indicated by Du Maurier, tells the manservant to take Mr. Gladstone into the breakfast-room when he calls and to "ask him to be so kind as to wait a little while." Then turning to his lady patient the struggling medical man says: "Now, Madam!"

In 1863, when Burnand joined the staff of *Punch*, the medical jests—we speak always of illustrations only—depict astute formal old fellows, dressed for a part, as it were, with high Gladstone collars, stocks, coats representing a cross between evening dress and the frock coat, glossy top-hats, always carried into the sick-room, and double eye-glasses hung on a thick ribbon. "There is not much the matter with him," says a quaint "family doctor" in reference to a little boy, "but I am afraid we must cut off his animal aliment." And Tommy boo-boos and hopes that "it won't hurt." Here, of course, is the ancient tradition involved in the "we" and the grand unusual phrase.

THE ECONOMICAL USE OF COCAINE.

To the Editor of THE LANCET.

SIR,—In view of the present high price of cocaine, it is important to avoid waste in its use. As usually employed for local anæsthetic purposes, it is applied in solution on lint or cotton-wool, a considerable proportion remaining on the latter and being thereby wasted. Moreover, solutions of the drug, if they have been long made, are untrustworthy, and not infrequently have to be discarded. For some years I have used glycerine of starch as a vehicle for the local application of cocaine and with entire satisfaction, and can recommend it as the most economical. It has the following good points.

1. It keeps indefinitely. Does not evaporate, and consequently does not dry up. I have by me the remains of a supply made five years ago and it is as active as ever.
2. It can be applied to skin or mucous membrane without wool or lint. Simply spread it over the surface as thickly or thinly as desired.
3. It is very absorbable.
4. It can be prepared in any strength, cocaine being soluble in glycerine of starch in practically any proportion.
5. It is as convenient to handle as an ointment, but without the latter's greasiness.

By cocaine I mean, of course, the hydrochloride. The alkaloid itself is insoluble in glycerine preparations.

I am, Sir, yours faithfully,

Bournemouth, May 13th, 1917. J. T. HALL, L.D.S.

VITAL STATISTICS OF NYASALAND.

AN official report on Nyasaland for the year 1915–16 has just been presented to Parliament by the Colonial Office. From this it appears that the native population is estimated at 1,137,572, being approximately 505,121 males and 632,451 females. The number of European residents in the Protectorate, comprising officials and non-officials, during the year was 523 males and 262 females—total 785—and the Asiatic population amounted to 379. Amongst the Europeans 13 marriages were celebrated; the birth-rate was 26·75 and the death-rate 16·56 per mille.

The public health of the Protectorate was not altogether satisfactory during the year. An epidemic of small-pox broke out in the Lilongwe and Dowa districts, and out of 3535 cases there were 941 deaths. There were 29 cases of sleeping sickness recorded (principally in the proclaimed area of the Dowa district), as against 39 in 1914, 64 in 1913, 46 in 1912, and 38 in 1911. There were 621 cases of malaria, as compared with 729 in the previous year. As regards other mosquito or insect-borne diseases, there were 2 cases of blackwater fever and 29 of trypanosomiasis. In a special note on the European officials, it is stated that 10 were invalided, as against 7 in the previous year. There were 188 cases treated, with one death, as against 151 cases and no death in the previous year. Malaria accounted for 41 of the total admissions, or 22 per cent. Amongst the general European population there were 300 cases treated in 1915, as against 240 in 1914, the principal diseases in order of frequency being malaria, local injuries, and diarrhœa. These statistics do not include cases treated by Mission doctors.

STRETCHER-BEARING.

To the Editor of THE LANCET.

SIR,—As one deeply interested in the welfare of our wounded soldiers, I beg to call your attention to the dangerous practice of carrying seriously wounded men on stretchers *shoulder-high* prevailing at the front. In all cinema war-films the Hun prisoners engaged in carrying our poor wounded are shown doing so in this manner, which is decidedly wrong and very trying to the patient.

Is it not the case that General Stonewall Jackson, after being wounded, came to his death from a fall from a stretcher carried shoulder-high through one of his bearers being shot? The proper way to carry a patient on a stretcher is at full length of the arm.

I am, Sir, yours faithfully,

A. MACLURE,

West Hampstead, May 14th, 1917. Major, late London Scottish.

*** The carrying of the loaded stretcher shoulder-high can only be justified by exigencies of space. Strain on the bearers' arms should be avoided by shoulder-slings.—ED.L.

THE WOUNDED ALLIES RELIEF COMMITTEE.

THE Wounded Allies Relief Committee has removed from Grosvenor-gardens, and the headquarters of the organisation are now at Bank Chambers, 329, High Holborn, W.C. 1.

X.—Many kinds of depilatories have been used, generally containing a sulphide of an alkali or alkaline earth. Electrolysis affords good results in the hands of an expert. The necessity for depilation may be avoided by rendering the hairs less conspicuous by means of peroxide of hydrogen.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, May 23rd, 1917.

Date.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
May 17	0·16	60	53	45	46	47	Raining
,, 18	0·53	95	65	47	52	53	Cloudy
,, 19	0·06	85	63	53	59	61	Cloudy
,, 20	0·18	109	69	53	56	57	Cloudy
,, 21	0·86	101	68	56	59	59	Overcast
,, 22	0·02	113	71	55	56	57	Cloudy
,, 23	...	118	72	56	60	64	Fine

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

Medical Diary for the ensuing Week.

SOCIETIES.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY, West London Hospital, Hammersmith-road, W.

FRIDAY.—8.30 P.M., Meeting.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—Hospital closed.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham); Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).
WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).
THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY.—4 P.M., Lecture VII.:—Dr. A. E. Shipley: Health and Insect Life in War and Peace. Followed by a discussion.

The following journals, magazines, &c. have been received:—Cleveland Medical Journal, Duodecim, British Dental Journal, Military Surgeon, British Journal of Dental Science, British Journal of Surgery, Annales de Médecine, Hospital Gazette, American Journal of Medical Sciences, Interstate Medical Journal, Medical Officer, Therapeutic Gazette, Archives of Pediatrics, Medical Journal of South Africa, Medical Times.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C. 2.

MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d*. The rates of subscription remain as revised in October.

INLAND.

One Year	... £1 10 0
Six Months	... 0 16 0
Three Months	... 0 8 0

COLONIES and ABROAD.

One Year	... £1 12 6
Six Months	... 0 17 6
Three Months	... 0 8 9

Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C. 2.

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Goulstonian Lectures
ON
PARATYPHOID INFECTIONS.

Delivered before the Royal College of Physicians of London.

BY CHARLES HEWITT MILLER,
M.D. CAMB., F.R.C.P. LOND.,
ASSISTANT PHYSICIAN, LONDON HOSPITAL; PHYSICIAN, VICTORIA HOSPITAL FOR CHILDREN; LATE MAJOR (TEMP.), R.A.M.C.

LECTURE II.*

II. THE DYSENTERIC TYPE.

THE term dysentery is apt to be too freely used for conditions in which a painful diarrhœa is the chief symptom. It should be limited clinically to those cases in which there is a frequent passage of blood and mucus accompanied by pain and tenesmus.

Can the Paratyphoid Organisms cause Dysentery?

The first point to be discussed is whether the paratyphoid organisms can cause dysentery. There have been hundreds of cases of dysentery, many of them from Gallipoli, whose stools yielded only the paratyphoid organisms in England.

Of the 310 cases from Gallipoli in my series 70 gave a history of dysentery; this is probably too low an estimate, as mild dysentery may have occurred and been overlooked by the patient. In very few of these cases was evidence of amœbic infection found.

It is beyond doubt that a very great number of amœbic infections occurred at Gallipoli, particularly in the months of July, August, September, and October. In November bacillary dysentery became more common, the Shiga bacillus being more frequently found than the Flexner.[1] Of the 70 cases of dysentery with paratyphoid stools that came under my notice, 58 of them began to be ill in the period of July to October—the amœbic period.

Lieutenant G. B. Bartlett, R.A.M.C., has kindly shown me the results of his post-mortem investigations on cases of the mixed condition of amœbiasis and infection by the paratyphoid organisms. His cases demonstrate that—

1. Amœbic ulceration of the colon may be present without there being any symptoms of dysentery. It was discovered post mortem in a patient who died from enteric fever due to *B. paratyphosus B* in whom there had been no symptoms of dysentery.
2. Signs of amœbic dysentery may begin in the stage of convalescence after paratyphoid fever.
3. The patient may be admitted to hospital suffering from amœbic dysentery and may develop the additional condition of paratyphoid fever.

Mixed infections of this sort were undoubtedly common; the mortality from them was low so that opportunities for proving the condition post mortem were few.

Bartlett's conclusions are based on post-mortem examinations, macroscopic and microscopic, and on examination of the stools during life. Amœbiasis of the colon may be present without giving rise to any symptoms. It is possible that the symptoms may be begun and kept up by secondary infections such as the paratyphoids.

On the other hand, there is no doubt that the enteric organisms do attack the large intestine. Ulceration of the large intestine in typhoid fever is found post mortem more frequently than is thought. It is stated by many observers, and, in my opinion, correctly, that the paratyphoid organisms are even more prone to select the large intestine for attack.

Torrens and Whittington[2] regard the affinity of *B. paratyphosus B* for the large intestine as a point in differential diagnosis.[3] French observers have noted inflammation and ulceration of the large intestine in paratyphoid fevers A and B.

Dawson and Whittington,[2] in reporting cases of autopsies on paratyphoid patients who died in France, describe 10 cases out of a series of 17 in whom the large intestine was inflamed or ulcerated. The 10 cases were all infections by *B. paratyphosus B*. "In the milder examples the lymphoid nodules were raised, hyperæmic and umbilicated, whereas in the severer forms there were ulcers of varying sizes and depths, the ulceration being most marked in the cæcum and colon as far as the splenic flexure. Notwithstanding the marked distribution of ulcers in the large intestine, it is noteworthy that there were no clinical manifestations of it."

Rathery and his colleagues describe three forms of colitis due to paratyphoid B: (1) Colitis with small ulcers; (2) perforating ulcerative colitis with large deep ulcers; (3) proliferating ulcerative colitis. There are post-mortem findings, and there was apparently no sign of amœbiasis.

As a result of post-mortem evidence it would seem that there can be ulceration of the colon caused by amœbæ or paratyphoid organisms without any symptoms of dysentery having been present; and that dysenteric ulceration may be caused either by amœbæ or by paratyphoids A and B. But it is doubtful whether the question is capable of so simple an answer.

In many cases of paratyphoid dysentery where neither amœbæ nor amœbic cysts have been found in the stools, it is not justifiable to attribute the dysenteric symptoms to paratyphoid organisms alone. These cases may have been amœbic in origin. The evidence of amœbiasis may have disappeared under treatment, or the technical difficulties of finding amœbæ or cysts may have been too great. With improved methods of search amœbic cysts are being found more often than before.

Wenyon and O'Connor[4] state that although amœbic dysentery was rife at Gallipoli during the summer months, bacillary dysentery was more common than is generally thought, and that "there has been a tendency to overestimate the amount of amœbic dysentery on the peninsula during the summer months of 1915, though they recognise that this disease was an important factor in the invaliding of our troops from this section of the Mediterranean."

Rajchman and Western[5] have issued an exhaustive report upon 878 cases of bacillary enteritis received from the Eastern Mediterranean. The patients were in the convalescent stage, but in spite of this the authors have been able to collect most valuable and conclusive evidence. Their results show that the epidemic of dysentery in our Mediterranean force was very complicated. "Both amœbic and bacillary cases existed side by side or actually in the same individual, while a number of cases were not those of dysentery proper so-called, but of paratyphoid fever, of which both varieties A and B were found; but typhoid fever did not play a rôle in the epidemic." Where the bacterial infection was mixed they found that the dysentery bacilli were the originally infecting virus. The two forms of bacillary dysentery (Shiga and Flexner) were found by them in some cases in a pure state, in others they were mixed with other infecting agents, such as the paratyphoid bacilli.

Considering the question in the light of recent work and of clinical observations the following conclusions may be stated:—

1. Paratyphoid fever A and B can begin with symptoms that can justifiably be called dysentery.
2. The paratyphoid organisms, especially A, may be found in the stools of patients who are suffering from dysentery which was originated either by protozoa or the *Bacilli dysenteriæ*.
3. The usually accepted causative agents of dysentery, protozoal and bacillary, may be present in the stools without the patient having had an attack of dysentery.
4. The problem is one practically confined to our forces in the Mediterranean area where multiple infections are common.

Part of the difficulties arise from the vagueness of terms. The word dysentery is only a name, and it is sometimes given by the patient himself to his condition. Once he is labelled with the diagnosis, he may go far through his hospital career before it is found that he is not infected with any of the recognised causes of dysentery but with something else.

Nomenclature is a troublesome matter for the would-be reformer, and I do not put forward my suggestions as perfect; but I should like to see some such classification as this in general use.

When the signs and symptoms point to enteric fever, let the condition be called enteric fever, and the letters T, A, or B added later as laboratory investigations are made.

When the signs and symptoms point to entero-colitis and the cause is not protozoal, the term bacillary entero-colitis could be used. (The abbreviation B.E.C. would be

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* Lecture I. was published in THE LANCET of May 19th, 1917.

[1] Journal of R.A.M.C., 1916, xxvi., Archibald, Hadfield, Logan, Campbell. [2] Loc. cit.

[3] Job et Salvat: Bull. et Mém. de la Soc. Méd. des Hôpit. de Paris, xxxvii., 3 S. Job et Ballet: Ibid., xxxix., 3 S.

[4] Journal of R.A.M.C., xxviii., Nos. 1 and 2, 1917

[5] Medical Research Committee, Special Report Series, No. 5. Report upon 878 Cases of Bacillary Enteritis.

quite at home with V.D.H., I.C.T., &c.) The distinguishing letters S, F, A, B, and T, if it were needed, could be added as the infecting bacillus was discovered.

Cases of Dysentery with Paratyphoid Organisms in Stools.

The following two cases are examples of dysentery, in one of which *B. paratyphosus A* and *B* were found in the stools, and in the other both paratyphoids and *B. dysenteriæ* (Shiga) in addition.

CASE 3.—A. W., inoculated against typhoid four months before; admitted in October, 1915, from Gallipoli. He had been ill for six weeks with dysentery; treated with emetine, bismuth, and castor-oil. On admission T. 101° F; he was emaciated, blue, cold, and collapsed, his mind was wandering, and he was moaning and could with difficulty be made to answer questions. Pulse just perceptible; throat and mouth ulcerated and covered with patches of membrane; abdomen retracted, tender and gurgling on palpation; skin covered with cyanotic petechial hæmorrhages. No control over rectum and bladder. There was a constant passage of small quantities of pink mucus with an occasional trace of fæcal matter and much preliminary griping. *B. paratyphosus A* and *B* both isolated from stools; no agglutination to any member of enteric and dysenteric groups on any examination.

This is a severe but typical example of many cases. As he recovered no further investigation was made. But whether this was originally a case of dysentery with a secondary infection by the paratyphoids cannot be known. It is interesting to note that another man who was admitted at the same time in exactly the same condition was infected with *B. dysenteriæ* (Shiga).

CASE 4.—S. T., inoculated twice against typhoid October, 1914. He went sick in November, 1915, with dysentery, diarrhœa, and passing blood; treated with emetine. Admitted Jan. 8th, 1916; frequent offensive stools with persistent blood; improved for some months, but in April and May was slowly losing ground. May 20th: Examination by sigmoidoscope revealed extreme ulceration; irregular ulcers were seen lying transversely with bridges and islands of mucous membrane, and coming down to within 4 inches of the rectum. June 3rd: Operation. Ileo-sigmoidostomy and enterostomy; definite improvement for a week. June 18th: T. rising; very ill. June 20th: Perforation of fæcum 4 inches above artificial ileo-sigmoid junction; general peritonitis; operation; suture; death. There was dysenteric ulceration of colon and ulceration of Peyer's patches of enteric type seen at operation; one ulcer had perforated. No P.M.

In this case there was bacteriological evidence of bacillary dysentery and of both paratyphoids. Pathologically there was ulceration of the colon, and ulceration of Peyer's patches. That is, there was a double infection, and evidence of two kinds of disease of the intestinal tract. To what extent, if any, these pathogenic organisms interacted is a matter for speculation.

From the purely clinical point of view the matter is not so complex. The patients have dysentery and they have paratyphoid organisms in their stools. Both the symptoms and the organisms have to be overcome.

There are no particular clinical features about these patients with paratyphoid dysentery. There are pain, tenesmus, and straining; the passage of blood and mucus; the extreme weakness and emaciation that are seen in all severe forms of dysentery.

The stools in amœbic dysentery consist of dark blood and mucus rather than of bright red blood and pink mucus. In bacillary dysentery the blood is brighter and is in streaks in the mucus, or the mucus is pink. In this form there is often a history of an initial fæcal diarrhœa which empties the intestine and is succeeded by the passage of blood and mucus. I mention these points with reserve, for my experience of dysenteric stools is not sufficiently extensive to justify a dogmatic statement.

In these cases of paratyphoid dysentery there are occasionally symptoms, as in the last case quoted, that indicate a more definite and specific infection by the paratyphoid bacilli, such as an exacerbation of the illness accompanied by a rise of temperature, headache, a crop of spots, and an enlarged spleen; in other cases jaundice has supervened.

Progress with these patients is very slow, and it is difficult to establish control over the sphincter and to obtain regularity of the bowels. Temporary relapses of a minor character are very common and may be brought on by a sudden change of the weather, particularly a cold east wind, and by indiscretions of diet.

A troublesome feature in some cases has been an intermittent spasm of the sigmoid. The patient is conscious of the periodic formation of a painful tender lump in the left iliac fossa which can be felt as a sausage-shaped tumour. Examination with the sigmoidoscope reveals the spasm very clearly.

III. THE BILIARY TYPE.

According to some observers, the infection of the bile-passages and gall-bladder by paratyphoid organisms has been very frequent; according to others it has been rare.

Thus Sarrailhé and Clunet[6] write of the frequency of camp jaundice at Gallipoli. They isolated from the blood a particular strain of paratyphoid organism which was present at the time of the incidence of the jaundice. This organism failed to give definite reactions with specific sera and was therefore not classified. They named it provisionally paratyphoid D (Dardanellensis), and it has since been proved in a large majority of the cases to be paratyphoid A.

This jaundice began to be prevalent in the middle of August. It occurred "among tired troops confined for several weeks in a restricted space and tried by imperfect feeding and unfavourable climatic conditions." Jaundice occurred either as a sequel to a febrile gastric derangement or as a feature of a febrile attack. In the latter there was great weakness, loss of appetite; there was no itching of the skin; convalescence was prolonged.

Jaundice was very prevalent at one time at Gallipoli, and some of the patients did not feel ill enough to report sick. These were to be seen working with the appearance of jaundice well marked, as has been reported by Dudgeon.[7] Rathery, however, comments on the rarity of jaundice and biliary complications among the 1088 patients in his series of *paratyphoid B. infections* occurring in Flanders.

Among the cases of my series jaundice of the catarrhal type has been seen—

1. Quite early in the illness; more often it appears after a period of malaise. It resembles a simple catarrhal jaundice in character and is seldom severe or troublesome.
2. It can appear later in the illness; it has been seen on several occasions during the unsatisfactory stage of convalescence when the temperature is not steady. It is of the catarrhal type in these cases, but is rather more severe and lasting in the latter.
3. It has a tendency to become recurrent. After the patient has had a mild attack of jaundice and has quite recovered and been in good health for months the jaundice may return and be much more severe than in the original attack.

CASE 5.—An officer, in Gallipoli from start to finish, was never really ill there, but had indigestion, slight jaundice, and dysentery. A year later, in France, he was suddenly taken ill with gastric discomfort and vomiting; jaundice set in and became very deep. Liver and spleen enlarged; occasionally slight tenderness over gall-bladder region; great itching of skin and recurrent attacks of urticaria: P. 68. *B. paratyphosus A* in stools. Jaundice lasted 10 weeks, but patient was feeling quite well long before colour had disappeared from skin.

Cholecystitis may occur and may be accompanied or not by jaundice.

Several cases of acute cholecystitis without jaundice have been seen. In most of those that I have seen there has been a transitory tinge of the conjunctivæ and a darkening of the urine, sufficient for the patient to notice it. Acute cholecystitis with severe jaundice has also been noticed, but in some of the cases there was an empyema of the gall-bladder.

Morley and Battinson Smith[8] have described an unusual case of acute gangrenous cholecystitis with spreading peritonitis occurring in the epidemic of jaundice in Gallipoli. Campbell isolated *B. paratyphosus B* from the bile and stools of this patient.

The following case throws an interesting light on the possible sequels of paratyphoid infections of the biliary tract.

CASE 6.—Army pensioner admitted to hospital for recurrent attacks of pain and jaundice; had very severe attack of enteric fever in Boer War. In 1904 two attacks of colic and jaundice. He was free from attacks for 11 years from 1904 to 1915. From August, 1915, to April, 1916, he had 12 attacks beginning with shivering, vomiting, and pain of varying intensity. The stools at once became light in colour and the urine dark. The jaundice lasted 4 to 14 days. Edge of liver palpable and gall-bladder just felt. At operation gall-bladder was found to be inflamed, adherent, and friable; it contained a few gall-stones. *B. paratyphosus B* isolated from bile.

This case and the previous one illustrate two different clinical forms of jaundice occurring late in the course of a paratyphoid infection; for it is reasonable to infer that in the first case the paratyphoid infection occurred at Gallipoli and in the second in South Africa.

In their investigation into jaundice of infective origin in France, Dawson and Hume[9] report 26 cases of the enteric group, of which 6 were due to typhoid, 14 to paratyphoid B, 4 to paratyphoid A, 1 to a double infection of paratyphoid A and B, and 1 to an undetermined infection of the enteric group. One of these cases was fatal from acute pneumonia.

In their post-mortem reports Dawson and Whittington obtained paratyphoid bacilli from the gall-bladder on 14 occasions—13 B and 1 A. In 1 case there was increasing

[6] Sarrailhé et Clunet: Bullet. Mém. de Soc. Méd. des Hôpitaux de Paris, xl., 3 S., 1916, and THE LANCET, March 25th, 1916.
[7] Dudgeon: Proc. R. Soc. Med., ix., No. 6.
[8] Brit. Med. Jour., March 25th, 1916.
[9] Dawson and Hume: Quart. Jour. Medicine, x., Nos. 37 and 38.

jaundice during life, and abscesses of the liver were found post mortem. In 2 cases purulent fluid was found in the gall-bladder, but in neither case was there jaundice during life.

There is no doubt that the paratyphoid organisms frequently invade the biliary system, but do not so frequently cause jaundice at the time; but there is a considerable danger of chronic cholecystitis with the formation of gall-stones being found months or years afterwards, and there is a great danger that the gall-bladder may become a reservoir of infected bile which is periodically discharged into the intestine.

IV. NEPHRITIS AND OTHER AFFECTIONS OF THE URINARY TRACT.

Albuminuria is commonly present for a few days at the height of the fever, but this hardly needs comment. But there is a very great tendency for the paratyphoid organisms to find their way into the urinary tract. In several cases the organisms can be found in the urine both in the acute stage and afterwards for a varying length of time without there being any evidence of infection of the urinary tract.

Nephritis.

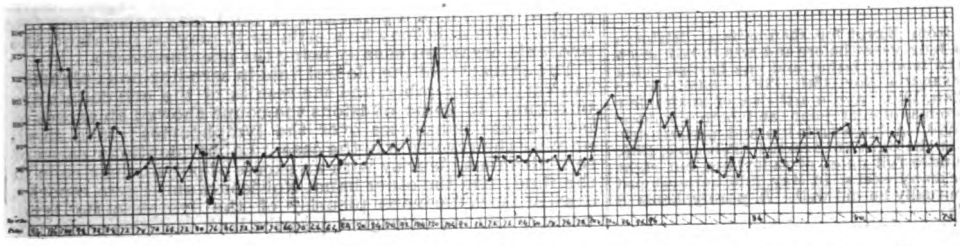
Acute nephritis is fairly common; it was present in 4 per cent. of my cases. It was most commonly found in the period when "trench nephritis" was so prevalent. Possibly this figure is too low. The patients were admitted with the diagnosis of nephritis, and the paratyphoid infection was discovered later. Possibly some cases escaped detection.

There is nothing peculiar to the nephritis of paratyphoid. The cases differ in type and degree of severity in exactly the same manner as in other infective inflammations of the kidney. The results are also similar. The mild cases make an apparently good recovery, though their convalescence and period of symptoms is prolonged. The severe forms commonly pass into a chronic condition with permanent cardio-vascular changes and have to be invalided out of the service or put into the sedentary class. Whenever there was a history of previous renal disease the progress was more slow and the result unsatisfactory, and, broadly stated, men over 35 years were unfit for full service again, even if their progress had been good.

A curious condition was noticed on several occasions. Patients were admitted bearing the yellow label of "nephritis." The face, eyelids, and ankles were swollen and had been in that state for a few days. The urine was normal as regards quantity and absence of albumin. Several of these patients had paratyphoid A or B in their stools. In some of them it was noticed that the cardiac area was enlarged, the apex beat displaced outwards, and the cardiac action rapid, especially on examination. Their progress was uneventful and they were soon free of symptoms.

Moorhead[10] reports that in 5 per cent. of his cases there was retention of urine at the onset of the disease.

CHART 6 (Case 7).



Enteric fever, paratyphoid B. Prolonged irregular temperature, with two recrudescences. Acute nephritis.

The following is an example of a severe case of acute nephritis (paratyphoid B).

CASE 7.—W. D., aged 22, admitted from France, Dec. 4th, 1915, as nephritis. History: Ill four weeks; began with swelling of face; passed a lot of water at first; no headache, no sickness, no sore throat; bowels not properly open. Condition: Flushed, dry skin; tongue white; T. 103° F. (Chart 6); P. 84, dicrotic; spleen palpable; a few rose-red spots on abdomen; basal bronchitis. Urine 18 oz. in 24 hours; dark and smoky, with a brown sediment. Reaction neutral, albumin ¼; blood cells, blood casts, and epithelial casts. Treatment: Urotropine gr. x. t.d.s. Dec. 18th and Jan. 24th: Albumin a trace, pus cells, and casts. Feb. 17th: Albumin a cloud, no casts. Feb. 26th: No albumin, no casts. Brachial blood pressure, 116 mm. Hg. Bacteriological examinations: Dec. 8th, agglutination +++ to paratyphoid B; paratyphoid B isolated from stools Dec. 16th; from urine Jan. 7th, and similar results on other dates.

Progress.—The temperature came down by lysis, and though not steady was not above 99° for three weeks; then there was a recrudescence lasting six days, and one week later another recrudescence of milder character, after which progress was uninterrupted. The relapses were of the enteric type, and the urine was not affected. On discharge he was passing 50–60 oz. of normal urine per diem.

This case may be regarded as one of paratyphoid fever in which the first onslaught was felt mostly by the kidneys. As time went on the "enteric" character of the disease became more definite, and as the "enteric" relapses occurred there was no further inflammation of the kidneys.

The following case is one with vascular-renal changes.

CASE 8.—J. S., aged 40, admitted for nephritis. History: Eight weeks before had been very wet and felt generally ill afterwards. Two weeks later he got very wet again. Swelling of face, legs, and stomach noticed soon after; headache very bad. Urine almost solid with albumin; blood present in large quantity; epithelial casts. Brachial blood pressure 154 mm. Hg. Three months later albuminuric retinitis was discovered. *B. paratyphosus B* isolated from stools on several occasions.

In this case there was probably some vascular-renal deficiency of long standing. There was no "enteric" feature in the disease. It might be argued that this was a case of chronic nephritis with an accidental contamination of the stools that had nothing to do with the renal condition, but I should prefer to regard it as a case of imperfect kidneys made worse by a microbic infection.

CHART 7 (Case 9).



Enteric fever, paratyphoid A infection. Acute nephritis. Prolonged irregular temperature with some morning rises and evening falls.

The following case presents several points of interest:—

CASE 9.—H. F., aged 30, admitted April 4th, 1916, from Egypt for nephritis. History: Illness began in February with headaches, swelling of legs and feet, and fever. Temperature raised on the boat. Condition: Intense headache and photophobia; muscular twitchings; breath urinous; great emaciation. T. 102·2°, P. 76. Partial incontinence. Urine very scanty; half albumin. After two days he passed 100 oz. of urine containing a trace of albumin; this condition persisted. Rose-red spots, enlarged spleen, high temperature with inverted remissions, and slow pulse made the diagnosis of enteric fever definite. (Chart 7.) Bacteriological examinations April 7th: *B. paratyphosus A* in stools; urine sterile. He ultimately made a good recovery and on discharge was passing 70 oz. of urine free from albumin.

His condition on admission was very grave; it is difficult to say how much of it was uræmic and how much the typhoid state. It seemed to be a mixture of both conditions.

But the greater number of these patients have milder conditions. There is usually swelling of the face and legs, a small quantity of albumin in the urine, blood cells and a few epithelial casts. Isolation of paratyphoid organisms from the urine is infrequent, but the presence of the organisms in the stools and the agglutination reaction will decide the nature of the infection.

The symptoms are usually very obstinate, headache, backache, and morning puffiness of the eyes lasting a long time even after the urine is free from albumin. The majority of the younger men return to duty of some sort, but not many are fit for the trenches until they have been under care and observation for a long time.

Other urinary infections are as follows:—

Pyelitis occurs occasionally and pyonephrosis caused by *B. paratyphosus B* was seen in two cases.

Worster-Drought and Kennedy[11] have described an interesting case of acute urinary infection with paratyphoid B. There were acute vesical symptoms and pyuria. There were no signs nor symptoms of any infection of the alimentary canal.

[10] Moorhead: Med. Press and Circular, 1916.

[11] Brit. Med. Jour., May 6th, 1916.

Cystitis is one of the commonest and most lasting of the later troubles. It may occur with pyelitis or without it. At first there is pyuria and the passage of urine containing the paratyphoid organism. Later the *Bacillus coli* appears and swamps the paratyphoid bacillus. Such patients may become very obstinate and dangerous carriers.

The urinary tract seems to be very vulnerable to the paratyphoid infections, especially to *B. paratyphosus B*. It is seldom that it is possible to speak warmly about the properties of a drug, but in these infections the benefits obtained from urotropine are very striking. It is my opinion that a routine use of urotropine would be found beneficial in all paratyphoid fevers, both for prevention and cure of urinary infections.

V. THE "RHEUMATIC" TYPE.

I am using the term "rheumatism" in the popular sense, and not according to strict medical terminology. In popular usage "rheumatism" will describe all forms of inflamed painful joints and muscles.

Apart from the aching backs and legs of which so many paratyphoid patients complain, there are a number of conditions to which the term "rheumatism" can be applied. Articular rheumatism has been observed by several writers. Nobécourt and Peyre[12] say that it is a common feature in paratyphoid fevers, especially in paratyphoid B. Wiltshire has drawn attention to arthralgia and myalgia. Among my cases there was a surprising amount of "rheumatism," as many as 8 per cent. being affected in various ways.

1. Acute articular rheumatism was seen in a few cases.

The joints were hot, swollen, and painful; usually there was considerable fluid. The condition was improved by sodium salicylate in full doses. In addition to the rheumatism some of the signs of an enteric infection were present, and there was positive bacteriological evidence. In several of these cases there was a history of a previous attack of acute rheumatism.

2. A condition more closely resembling the "infective" type of arthritis was commoner.

In more than one case the suspicion of gonorrhœa was entertained before it was disproved and the presence of a paratyphoid organism discovered. In these cases the knee-joints were particularly affected. There were heat, swelling, and pain in the joints. The swelling was synovial and in the neighbouring tendons and other periarticular tissues. It was accompanied by great wasting of muscles. The results were unsatisfactory; partial ankylosis occurred in two cases, and in others the joint had to be very gently treated for a long time. There was a great tendency for the joints to swell again with the least strain on them.

Many of these joints had previously been damaged at foot-ball and they became acutely inflamed during paratyphoid fever.

In others the patients came under observation on account of their joints and were found to be infected with paratyphoid organisms.

The following two cases are illustrations of these two conditions. Also both suffered from acute iritis in the later stages of the disease.

CASE 10.—L. H., admitted from Egypt for rheumatism. History: He had swollen painful joints four years before and was in bed seven weeks. Rheumatism is in the family, father and one brother being subjects. He landed at Alexandria Nov. 15th, 1915. Admitted to hospital for dysentery Dec. 25th, 1915. Acute arthritis of ankles, left knee, left wrist, left temporo-mandibular joint, and both shoulder joints set in on Jan. 7th, 1916. A large arthritic and periarthritic effusion developed in and about the right knee early in February, 1916. The other joints cleared up under full doses of salicylates, but right knee remained *in statu quo* for many weeks. In May, 1916, he developed acute iritis of left eye. Eventually he did well. *B. paratyphosus B* repeatedly isolated from stools.

CASE 11.—J. B., admitted from Mediterranean for bronchitis and emphysema. On admission both knee-joints swollen and painful; swelling fusiform. Fluid in joints and tissues above and below joint. Later he developed double conjunctivitis and iritis. He did not respond to salicylates. *B. paratyphosus A* repeatedly isolated from stools.

3. There is a group of cases which, for want of a better term, I have called the "trench-fever type." This group can for convenience be described under the heading of "rheumatism."

Before there were such complete and detailed accounts of "trench fever" I had noted that occasionally painful, tender shins, worse at night, were symptoms of a mild type of paratyphoid fever. The onset in these cases was sudden; the temperature was usually not as high as 103° F. They were not seen at all frequently until April, 1916. They came into hospital with the diagnosis of "trench fever," and they closely resemble it. They were found bacteriologically to be paratyphoids. On the other hand, the majority of the "trench fever" patients gave no bacteriological evidence of being paratyphoids. The following cases are examples:—

CASE 12.—J. P., admitted June 15th, 1916. Labelled "typical trench fever, T. 102·4°." Inoculations: typhoid, two, October, 1914; T.A.B., two, May, 1916. History: On June 1st sudden onset of shivering, headache and legs aching. Temperature, June 15th, normal; shins still tender and painful at night. *B. paratyphosus B* repeatedly isolated from stools.

CASE 13.—W. S., admitted as trench fever May 24th, 1916. In hospital since April 17th. Has fever every five days; aching shins very bad at night. *B. paratyphosus B* isolated from stools.

CASE 14.—F. C. S. admitted as "trench fever" August 27th, 1916. Inoculations: Typhoid, two, June, 1915; T.A.B. two, April, 1916. History: Went sick two weeks before; had fainted twice on the march. He complained of pain in back and legs and bad headache. Condition: T. 102·2°, P. 100; tongue dry, shins very tender; internal saphenous veins thrombosed over the malleolus; abdomen firm; some possible spots, fading; drowsy. *B. paratyphosus A* isolated from stools.

The last case was more definitely of a clinically enteric type. I quote these cases to show that the syndrome of trench fever may be associated with a paratyphoid infection. Though relatively only a few cases of trench fever will yield evidence of paratyphoid infection, it is important to exclude paratyphoid in the cases which present the "trench fever" group of symptoms. For there is evidence to show that the two diseases can easily be confused, and it takes time and repeated examinations to distinguish them. This type of paratyphoid fever did not come under my notice in the early months of the war, nor did I see any in cases from Gallipoli. I am at a loss to explain why this should appear in the spring of 1916 and after. The number of cases is too limited for any theory to be put forward, but it is worthy of note that the nature of paratyphoid fever has changed entirely since the triple vaccination became general. Further than that it is impossible to go.

VI. DISEASES OF THE RESPIRATORY TRACT, BRONCHITIS, PLEURISY, AND PNEUMONIA.

Infections of the respiratory tract are common. In fact, Labbé regards them as the only complications that are specific to paratyphoid fever.

Bronchitis is very commonly present.

Usually it is only a mild condition, but there may be general bronchitis of a severe type. Minet[13] describes 8 cases of severe bronchitis occurring as the first evidence of the disease; of these 6 were paratyphoid B and 2 were paratyphoid A. Other observers have made similar records.

The onset in these cases is sudden, often with a rigor, and the patient is more ill than the physical signs in the chest would indicate. In a few days the clinical features of enteric fever and the bacteriological tests will settle the diagnosis.

Pleurisy is far from uncommon in paratyphoid fever.

It may be quite trivial and pass away in a few days or it may be the starting-point or accompaniment of pneumonia. A very acute pleuro-pneumonia may follow rapidly on a pleural friction, or a collection of fluid may appear in a few hours. The fluid may be sterile or it may be purulent, the pyogenic organism usually being the pneumococcus.

The character of the pleural fluid in sero-fibrinous pleurisy can vary considerably, and the results of the cell counts are puzzling. In some effusions the count showed an excess of polynuclear leucocytes over the lymphocytes; in a small number the reverse was the case. Labbé mentions cases of sero-fibrinous pleurisy with an excess of polynuclear cells in the fluid. On the other hand, Nobécourt and Peyre report a case of sero-fibrinous pleurisy of the lymphocytic type. Rathery and his colleagues describe both varieties occurring in paratyphoid B fever, but in their one case of lymphocytic pleural effusion there was a history of death from tuberculous meningitis 7½ months later.

When organisms are isolated from the pleural fluid they are found to be of the pyogenic varieties, most commonly the pneumococcus, and the effusion becomes purulent.

The two cases described below illustrate the features of the lymphocytic pleural effusions. The relationship between paratyphoid infections and possible tuberculosis will be considered later.

CASE 15.—A.S., admitted for pneumonia. The illness started with a rigor. On admission pleural friction with impaired resonance and diminished breath sounds at right base and axilla. In 48 hours signs of fluid very definite and heart displaced outwards. Clear fluid was withdrawn by aspiration, which was sterile and showed a large excess of lymphocytes. *B. paratyphosus B* repeatedly isolated from stools.

[12] Nobécourt et Peyre: Bull. et Mém. de Soc. Méd. des Hôpitaux de Paris, 1916, iii. S., xl.

[13] Minet: Bull. et Mém. de Soc. Méd. des Hôpitaux de Paris, 1915, iii. S., xxxix.

There was nothing in the history, the signs, or the subsequent course to suggest the presence of tuberculosis.

CASE 16.—E. R., admitted for dysentery, from which he was convalescent. The day before admission he had pain in right side and shivering. He was cold, blue, and collapsed. The signs were those of pleurisy and consolidation of right lowest lobe. In three days there was a large effusion which was aspirated then and on three subsequent occasions. He ultimately did well.

The fluid on all occasions was clear, sterile, and showed an excess of lymphocytes. No tubercle bacilli found in sputum but radiogram showed opaque glands at roots of lungs with radiating bands of fibrous tissue in lung. *B. paratyphosus A* present in stools.

As has been mentioned, a pneumococcal empyema may occur during paratyphoid fever. The following case is an example, and it further illustrates a condition of partial consolidation of the upper lobe, which gives rise to signs similar to those of pulmonary tuberculosis.

CASE 17.—C. B., admitted with diagnosis "pulmonary tuberculosis." Illness began in France with broncho-pneumonia Feb. 25th, 1916. Admitted March 16th, 1916. The signs were those of dry pleurisy over right lowest lobe. Upper lobes on both sides, back and front, presented signs suggestive of pulmonary tuberculosis. Percussion note impaired; tactile vocal fremitus increased; breath sounds high-pitched, with lengthened expiration; vocal resonance increased in pitch and intensity, and whispered voice was conducted outside bronchial area. In addition fine râles heard both front and back. A pneumococcal empyema developed and was treated surgically. Several small crops of spots occurred at different times; spleen palpable. *B. paratyphosus A* and *B* isolated from stools.

Repeated examinations of the sputum for tubercle bacilli were negative. After the empyema had been drained the signs in the upper lobes passed off and on discharge it was impossible to detect anything abnormal. He left the hospital looking the picture of health.

Lobar and *broncho-pneumonia* are seen in paratyphoid fever.

They are seen either as the initial condition or occurring at any time in the course of the disease. In any case the occurrence of pneumonia is a very serious feature, and the prognosis is bad. There is a tendency for broncho-pneumonia to be of the "creeping" variety. As one consolidated area begins to resolve a neighbouring unaffected area becomes solid. In some of these cases hyperpyrexia has been seen and commonly very excessive sweating occurs.

In a case recently seen left basal pleuro-pneumonia began with a rigor and an attack of diarrhœa. Gradually, catarrhal signs and signs of consolidation spread over both lungs. After eight days diarrhœa started again; spots of the paratyphoid variety came out on the abdomen, and the spleen was palpable. The temperature was above 104° F. for two weeks, and gradually rose to 107°, when the patient died.

The paratyphoid bacilli apparently do not attack the lungs and pleura themselves. Labbé, however, mentions a case of abscess of the lung, from the pus of which *B. paratyphosus B* was isolated. Apart from this rather special case, I cannot find a recorded instance of paratyphoid bacilli being found in pleural fluid ante mortem, nor in the lungs post mortem. I can only think that if these organisms do attack the lungs and pleura it must be but rarely.

It is interesting to note that many patients suffering from wounds of the chest and hæmothorax became infected with paratyphoid organisms. These wounds were important predisposing factors.

The relationship of paratyphoid infections to *tuberculosis* has been mentioned in the descriptions of the last three cases.

If a lymphocytic pleural effusion is to be regarded as a sign of tuberculosis and of nothing else, it would appear from the consideration of my cases and those described by others, that the power of paratyphoid infections to activate latent tuberculosis is great. Rathery's one case in which a fatal termination was due to tuberculous meningitis is very suggestive.

In the second of my cases described I have a strong suspicion that there was underlying tuberculosis. In the other case, however, there was no indication of tuberculosis. I am, however, inclined to the opinion that the lymphocytic effusions which have been seen in paratyphoid affections are really evidence of tuberculosis stirred to activity by the paratyphoid infection.

Pulmonary tuberculosis may reveal itself during the acute stage of paratyphoid fever. More commonly it occurs during the stage of convalescence. In such patients there may be a history of some former chest trouble which would cause a suspicion of tuberculosis.

On the other hand, there may be well-grounded suspicion of pulmonary tuberculosis, which events fail to prove, as in the case of empyema just quoted. In that case I was convinced for some days that there was pulmonary tuberculosis, but eventually the diagnosis had to be given up. I learn with interest that Rathery and his colleagues had difficulties of the same kind, and in the end gave up the diagnosis of pulmonary tuberculosis on the signs found in the upper lobes in these cases.

The paratyphoid organisms can also rouse latent tuberculosis in other parts of the body. During convalescence from a mild attack of paratyphoid A fever one patient developed a rapidly progressive tuberculous peritonitis, which was arrested only after prolonged treatment.

VII. THE INFLUENZAL TYPE.

Influenza and paratyphoid fever have much in common. Not only do both diseases appear in divers forms, but paratyphoid fever can imitate the forms of influenza so closely that at the onset of the fever it may be impossible to distinguish between the two conditions. Later, in the course of paratyphoid fever, we may expect to find some of the signs that point to an enteric infection, but they do not always appear, and the diagnosis is made by the bacteriologist on nothing more than the suspicions of the clinician.

Paratyphoid fever may simulate three different forms of influenza.

1. *Respiratory form.*—The onset is sudden with rhinitis, pharyngitis, and often laryngitis. The catarrhal condition may travel downwards and affect the trachea and bronchi. There is a moderate amount of fever and a slow pulse; frequently there is copious sweating. Towards the end of the first week more definite indications of enteric fever may be present. Stolkind lays stress on the prevalence of this form of infection, and undoubtedly there are plenty of examples to be seen.

2. *The gastro-intestinal form.*—In this variety the onset is sudden and accompanied by nausea, vomiting, abdominal pain, and diarrhœa. The condition of the patient may be very serious and fatal cases are reported. In time the characteristics of enteric fever may appear and the real cause of the condition can be investigated. Post-mortem examinations in such cases have revealed an intense gastro-intestinal inflammation without ulceration of lymphatic tissue.

3. *The nervous influenzal form* also occurs but is uncommon. As in the others, the onset is sudden with intense headache, irritability, and depression. In one patient who began with these symptoms, paratyphoid A and B organisms were found in the stools. Later he had a relapse which was purely of the enteric fever type.

These influenzal conditions are not likely to be suspected of being paratyphoid conditions, unless there are a good many known paratyphoid patients under observation at the same time. An individual case of this kind would probably escape detection unless the symptoms became very suggestive of enteric fever. But when one hears of small epidemics of gastro-intestinal influenza occurring in a town the suspicion should always arise concerning the nature of the infection, and it is highly desirable that paratyphoid infections should be proved or excluded. Most important of all, the manner of the origin and spread of the infection should be determined.

VIII. THE SEPTICÆMIC TYPE.

There is little to be said of this type.

It is seen most commonly in patients who die early in the disease. Post mortem no local lesions are found, but only the signs of an acute septicæmia. In some of the most virulent cases gangrene of the extremities sets in and progresses rapidly until the patient dies.

Job and Ballet describe three cases of death from paratyphoid fever (2 A, 1 B), in which the post-mortem findings were not distinctive of anything but septicæmia. Sawasaki also describes similar cases occurring in Japan.

VARIED CLINICAL MANIFESTATIONS OF PARATYPHOID INFECTIONS.

This concludes my description of the various clinical types of paratyphoid fever. It would not be difficult to add other varieties, and if, as is probable, I have omitted some forms that have occurred in the experience of other observers, I wish it to be remembered that this account, faulty and inadequate as it is, is only the account of what I personally have seen. It can be added later to the accounts given by others to help in making up the sum total of our clinical knowledge of paratyphoid fever.

It is obvious that the paratyphoid organisms can be protean in their clinical appearances. Paratyphoid fever may be regarded as a great imitator of other diseases. It may be like typhoid fever, like dysentery, like influenza, &c. But that is hardly the logical way of looking at it. It can cause infections and inflammations of so many systems of the

body that it is bound to resemble at one time this, and at another time another infective disease which we have come to regard as having a special morbid affinity for a particular system of the body.

Further, it has the quality in certain individuals of being able to call into activity diseases which were lying latent. Thus examples of rheumatic fever in the rheumatic subject, consumption in the patient who has arrested tuberculosis can be found in plenty. The relationship to malaria is peculiarly close. It is well known that any pyrexial condition occurring in the malarial subject will make the patient behave in the malarial fashion to a certain extent. But paratyphoid fever will bring on an attack that is malarial exactly. Further, the manner of onset in some cases of paratyphoid fever is very difficult to distinguish at first from malaria on clinical grounds.

There is a danger, that is clear to all, in such an examination as this that an obsession of paratyphoid infection might occupy the mind to the exclusion of all sense of proportion. I trust that I have steered clear of this danger in describing these forms of paratyphoid infections. But I do wish to emphasise my opinion that the infections by paratyphoid organisms are very widespread and may take a very great number of forms. It is not necessary to suspect paratyphoid fever in every case of unexplained pyrexia unless there are some definite clinical reasons for doing so. On the other hand, it is obvious that the question of paratyphoid infections will have to be considered much more seriously in the future than in the past, when epidemics of influenza and gastro-intestinal catarrh occur.

The infectivity of paratyphoid fever is very great and the amount of infecting material will certainly increase. It will be necessary for the strictest hygienic rules to be enforced in dealing with known cases, but as all the infective cases cannot possibly be known it is incumbent upon the community to protect itself by inoculation. But I can refer to this subject more conveniently later.

THE LEUCOCYTES IN CASES OF IRRITABLE HEART.

BY GRACE BRISCOE, M.B., B.S. LOND.

(A Report to the Medical Research Committee.)

THIS investigation was undertaken with the object of determining what changes, if any, are present in the white blood cells in cases of "irritable heart." All the patients investigated were soldiers admitted to the Mount Vernon Military Hospital suffering from the symptoms associated with the above condition—viz., breathlessness or palpitation on slight exertion, faintness, giddiness, præcordial pain, and general lassitude. Preliminary counts had shown that in some cases the number of non-granular cells in the capillary blood was considerably greater than normal both absolutely and relatively to the granular cells. Further investigation was undertaken to decide if this change was constant, and if it could be regarded as of value in diagnosis and prognosis.

The blood was obtained from the ear. The lobe of the ear was washed in absolute alcohol, the first drop of blood wiped away, the second drop which oozed out was used to make the film for the differential count. Blood was then taken for the total leucocyte count, Thoma's hæmocytometer being used. Acetic acid 0·5 per cent. with methyl green was employed as a diluent. An average of 400 to 500 cells was counted. For the differential count dried films were stained either by Leishman's or Giemsa's methods. A wet method described in the addendum was also employed.

The differential count.—The classification given by Cabot in Osler and McCrae's "System of Medicine," 1915, was followed. Granular cells: 1. Finely granular neutrophil cells or polymorphonuclears. 2. Coarsely granular cells or eosinophils. 3. Basophils or mast cells. Non-granular cells: 4. Lymphocytes. The large and small forms were counted separately, but in the tables only the total numbers of lymphocytes are given. 5. Large mononuclear cells.

There was some difficulty in distinguishing between the last two classes. The first counts from these patients showed a large number of cells which possessed a deeply indented nucleus, but the protoplasm was not relatively abundant, and "azur granules" were present in many cases. These cells amounted at times to more than half the total number of non-granular cells, and seemed to form a transitional class between the large lymphocytes and the large mononuclear or "hyaline" cells. The rule was adopted of classifying such cells among the lymphocytes, even if the nucleus was deeply indented, unless the nucleus occupied an area less than half of the cell. With this method of classification the count of large mononuclear cells fell in nearly every case within normal limits (1–4 per cent). In the wet counting method the large mononuclears are easily distinguished from the lymphocytes, and the parallel counts in dry and wet films showed approximately the same percentages.

(b) The margin of error.—The probable margin of error in the differential count is noticed further in the addendum. The importance of this will be seen later when the question of diagnosis is discussed. In a differential count of 400 cells the probable margin of error is considered to be 4 per cent. For the purpose of diagnosis a rise or fall of more than 8 per cent. in the lymphocyte count (400 cells counted) in blood taken at different times is considered to be outside the probable margin of error, and to indicate a real change in the proportions of the white cells circulating in the peripheral blood.

Comparison of variability of total and differential counts in cases of "irritable heart" with those of controls.—(a) *Total leucocyte counts.*—The total number of leucocytes in these cases is considerably higher than in normal individuals.

Ninety-three counts were carried out on 34 patients and 32 counts on 9 controls. The controls consisted of 3 medical men, 3 patients who had been sent to the hospital, but did not show any symptoms of "irritable heart," and 3 women. The times at which the counts were made were approximately the same, both in the case of patients and controls—viz., between 10 and 12 in the morning. Counts taken immediately after exercise are included in both sets.

Table I. is a general statement of all the counts made in patients and controls. The figure in each division of Column A represents the number of total counts which fell within certain limits, the letters in Column B the patients or controls on whom these counts were carried out, each letter representing a patient or control—e.g., of the counts which fell between 17,000 and 18,000 per c.mm., two were carried out on Patient I and one each on Patients M and R.

TABLE I.—*Total Leucocyte Counts.*

Cells per c.mm	Patients.		Controls.	
	Col. A.—No. of counts.	Col. B.—No. of patients.	Col. A.—No. of counts.	Col. B.—No. of individuals.
5,000	—	—	5	n,q.www.
6,000	4	P.T.T,i.	6	n,qqq,s,w.
7,000	6	S S. T,P,b,i.	7	n,o,p,r,s,ww.
8,000	7	C,D,G,I,T,X,e.	12	mm,oo,pp,rr,s,v, ww.
9,000	13	EE,H,N,O,O,O,T,UU, L,S,d.	1	q.
10,000	14	B.G.I I,P.R.T,H,Q Q, a g,j j.	1	m.
11,000	7	A,N,H,O,O,U,g.	—	—
12,000	8	I.I,Q,T.Y,J,Z,c.	—	—
13,000	7	L.K,N,Z,c.L.I..	—	—
14,000	6	H,T,K,M,W,f.	—	—
15,000	4	H,U,cc.	—	—
16,000	6	B,H,J,L,W W	—	—
17,000	4	I I,M R,	—	—
18,000	4	G.M.T, c.	—	—
19,000	—	—	—	—
20,000	2	R, K	—	—
21,000	—	—	—	—
22,000	—	—	—	—
23,000	1	J	—	—
24,000	—	—	—	—
—	93 counts.	34 patients.	32 counts.	9 individuals.

The average total count of the patients was 12,100 cells per c.mm. (lowest 6800, highest 23,800). The average of the controls was 7400 per c.mm. (lowest 5000, highest 10,040).

The degree of leucocytosis in these patients appears to be directly proportional to the amount of exercise taken before the count is made, other factors, such as food, being the same. Of 38 counts made while the patient was in bed or after he had been lying on his bed for an hour, the average was 10,600 per c.mm. (lowest 6800, highest 16,800). Of 31 counts on these patients walking about in the ordinary way, the average was 12,700 per c.mm. (lowest 7100, highest 18,200). Of 17 counts made immediately after a staircase exercise, the average was 15,000 per c.mm. (lowest 8700, highest 23,800). In 7 controls the average count after rest was 7100 per c.mm. (lowest 5700, highest 8400); the average after a staircase exercise was 8200 per c.mm. (lowest 6200, highest 10,040).

(b) *The differential count.*—The diurnal variation of the leucocytes, even in normal individuals, is considerable. It has been ascribed to such factors as fatigue, exercise, food, &c. The time of day, therefore, at which a differential count is made becomes important.

Four-hourly differential counts showed that the diurnal variation in cases of "irritable heart" is greater than in normal individuals and that a high lymphocyte count is very common. Differences of over 20 per cent. in the lymphocyte counts in the four-hourly intervals were frequently met with. Table II. is a general statement of the polynuclear percentages in the differential counts made on the first 50 patients examined and of 73 counts on 12 controls. The controls were 4 medical men, 4 soldier patients with no symptoms of "irritable heart," and 4 women. All the counts are given irrespective of time, exercise, or food, both in the case of patients and controls.

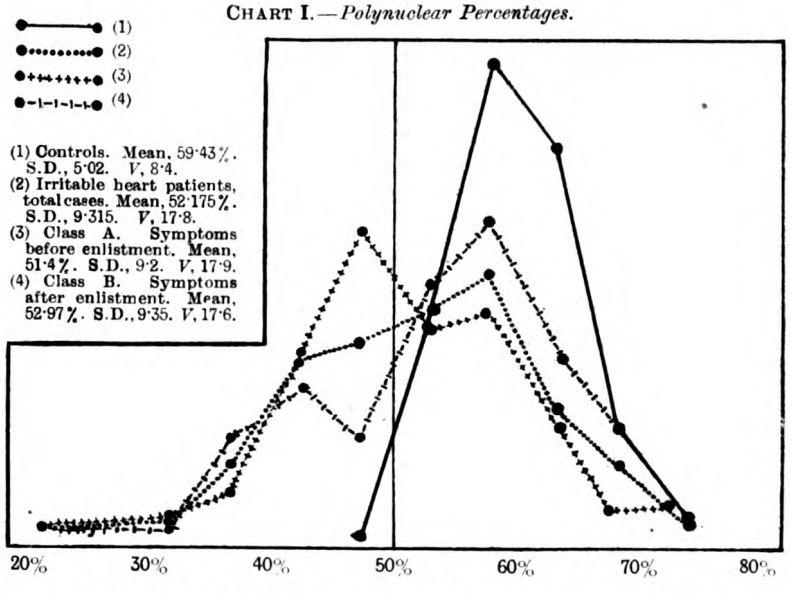
TABLE II.—*Numbers of Polynuclear Counts falling within Indicated Percentages.*

—	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	Total counts.
12 controls	—	—	—	—	—	1	12	23	23	7	2	73
50 patients	2	—	5	16	36	41	47	55	28	16	5	251
Class A—25 patients	1	—	3	6	20	31	22	24	12	4	5	128
Class B—25 patients	1	—	2	10	16	10	25	31	16	12	—	123

In Table II. the figures in the horizontal lines indicate the number of counts in which the percentage of polynuclears fell within the percentage limits indicated by the vertical divisions. Chart I. shows the same results in a graphic form, given in percentages—e.g., 38 per cent. of the control counts fell between 55 per cent. and 60 per cent. The 50 patients may be divided clinically into two classes: (*a*) symptoms were noted prior to enlistment (such as shortness of breath and inability to play games); (*b*) symptoms developed during training or after service abroad. The third and fourth lines in Table II. and corresponding diagrams in Chart I. give the figures resulting from this classification.

The polynuclear percentages alone are given in Tables II., III., and V., partly because there is a smaller error in dealing with larger percentages, partly because there is no difficulty in the classification of the polynuclear cells. Only one case showed a moderate eosinophilia (8–14 per cent.), the basophils were always below 2 per cent., usually below 1 per cent. In the two low counts appearing in the division 20 per cent. to 25 per cent., one had an eosinophil count of 9·6 per cent. and the other of 2·5 per cent. The percentage of non-granular cells in the first was 69 and in the second 78. Therefore the polynuclear percentage may be considered a fair inverse index of the number of non-granular cells present.

CHART I.—*Polynuclear Percentages.*



It will be noted that in the controls 70 per cent. of the whole series fell between 55 per cent. and 65 per cent., and the largest number (39 per cent.) in any single division, between 55 per cent. and 60 per cent. (Only one polynuclear count in the controls fell below 50 per cent., and this occurred in a patient who had no symptoms of "irritable heart," but who had recently suffered from an attack of malaria.) In the patients, however, 41 per cent. of the counts fell between 50 per cent. and 60 per cent., and only 22 per cent. between 55 per cent. and 60 per cent. In Class A the largest number of counts (24 per cent.) fell between 45 per cent. and 50 per cent., while in Class B the largest number (25 per cent.) fell between 55 per cent. and 60 per cent.—i.e., the same division which holds the largest number of control counts.

Diurnal variation in normals and patients.—Two constant factors emerge from a study of the differential counts at different times of the day.

TABLE III.—*Diurnal Variation of the Leucocytes: Polynuclear Percentages.*

Patients.				Controls.	
	6–8 A.M.	10–12 A.M.		6–8 A.M.	10–12 A.M.
No. 1	42%	... 64%	No. 1	56%	... 67%
	40 ,,	... 59 ,,			
	55 ,,	... —	No. 2	55 ,,	... 62 ,,
No. 2	42 ,,	... 50 ,,		51 ,,	... 63 ,,
	50 ,,	... 46 ,,		52 ,,	... —
	61 ,,	... —		52 ,,	... —
No. 3	47 ,,	... 62 ,,		51 ,,	... 65 ,,
	50 ,,	... —	No. 3	53 ,,	... 66 ,,
	58 ,,	... —		53 ,,	... 64 ,,
No. 4	34 ,,	... 53 ,,		53 ,,	... 64 ,,
	20 ,,	... 36 ,,		—	... 65 ,,
	41 ,,	... —		—	... 63 ,,
No. 5	44%	... 54%	No. 4	57 ,,	... 61 ,,
	36 ,,	... 63 ,,		10 counts.	10 counts.
	39 ,,	... 51 ,,		Average	Average
	38 ,,	... 58 ,,		53·3%	64%
	43 ,,	... 68 ,,			
	—	... 56 ,,			
No. 6	47 ,,	... 55 ,,			
	44 ,,	... 56 ,,			
	46 ,,	... 55 ,,			
	51 ,,	... 59 ,,			
	49 ,,	... 54 ,,			
	—	... 63 ,,			
No. 7	40 ,,	... 60 ,,			
	42 ,,	... 41 ,,			
	51 ,,	... —			
	25 counts.	21 counts.			
	Average	Average			
	44·4%	55·2%			

Both in controls and patients the polynuclear percentage is lowest between 6 and 8 A.M., and highest between 10 and 12 A.M. The average variation in both cases is about 10 per cent., but in the patients the polynuclear count is on a lower level at both times of the day, and the individual variations are much greater than in the controls. It will be noted that counts made on the same control at the same time on different days show very little variation. The controls consisted of two medical men and two women. The counts on the controls were made by four different observers, so that personal bias can be eliminated. No observations on the total count were made between 6 and 8 A.M., so that the absolute numbers at that time and at the middle of the morning cannot be compared. (Table III.)

H. G. Ward,[1] in a study of the hourly variations in the cells, found that the polynuclears were highest between 6 and 8 A.M., and lowest about midnight. On the other hand, A. G. Phear[2] states that the percentage of polynuclears is lowest in the early morning before breakfast. In ten observations on the same individual before breakfast he found an average percentage of 50 polynuclears (smallest percentage 47, largest percentage 54). The observations here recorded are in agreement with those of the last-named author.

Effect of rest in bed.—The moderate leucocytosis which these patients with "irritable heart" present when they are up and walking about, is not apparent when they are kept in bed.

Three patients who showed characteristic symptoms were put to bed for three days and then allowed to get up. The total count was estimated at 11 each morning, and differential counts were made every four hours.

Case 1 and Case 2 were kept on ordinary diet throughout. The differential count was of the same type whether in bed

or up—i.e., a low polynuclear count before breakfast, and a moderately high count at 11 in the morning.

The third case was kept on a milk diet while in bed and on ordinary diet when up. The differential count showed a steady rise in lymphocytes on the bed and milk régime,

TABLE IV.—*Total Leucocytes.*

—	In bed.			Up.	
	1st day.	2nd day.	3rd day.	1st day.	2nd day.
Case 1 ...	12,600	10,000	8,700	17,900	17,200
Case 2 ...	11,800	9,100	10,600	16,200	15,400
Case 3 ...	—	—	8,700	—	18,000

but the usual big variations between the granular and non-granular cells occurred when the patient resumed his ordinary life.

Effect of massage.—Three patients were given general massage, one for 20 minutes, the other two for 1 hour each. Very little difference was observed either in the total or differential counts taken before and after the massage.

TABLE V.

—	Length of Massage.	Total counts.		Polynuclear % counts	
		Before.	After.	Before.	After.
Case 1 ...	20 min.	6,800	7,200	60%	62%
Case 2 ...	1 hour.	10,000	10,600	51%	52%
Case 3 ...	1 hour.	13,000	13,700	56%	56%

Effect of exercise.—As the majority of patients showed symptoms of distress on exertion a test exercise was devised to see if these symptoms could be correlated to any change in the blood.

The test was carried out as follows. The patient was told to lie on his bed for one hour before coming to the laboratory, the ward and laboratory being on the same floor. Blood was taken for a differential count and a total leucocyte count. Then the patient was told to go down to the ground floor and back again 10 times at a sharp walk. This involved for each round the descent of two flights of stairs of 30 steps each, walking along the length of a corridor, the ascent of two corresponding flights of stairs, and along another corridor to the laboratory. The patients were watched and stopped if distress became evident. Some of the men were unable to carry out the complete test. A unit of exercise represents the ascent of one flight of 30 steps—i.e., a complete round was counted as 2 units of exercise. The amount of exercise in each case is given in the table, and the time taken over the exercise is noted. Blood was taken again for differential and total counts as soon as the exercise was finished, usually within two minutes of completing the test. The patient then had to lie on his bed for about an hour, and at the end of this period blood was taken again.

Muscular exercise is known to increase the number of leucocytes circulating in the peripheral blood, so it is important to note the degree of leucocytosis occurring in normal individuals as the result of the moderate exercise involved in the staircase test. The test was carried out on 7 controls in the same way as on the patients, except that Nos. 1 to 5 were sitting instead of lying down during the rest periods. Nos. 1 and 2 were medical men, Nos. 3, 4, and 5 were women, Nos. 6 and 7 patients admitted to the hospital for "irritable heart," but who did not show the typical symptoms on examination. No. 7 had recently suffered from an attack of malaria.

Table VI. gives the results of 14 observations in 13 patients, and Table VII. the results of 7 observations in 7 controls. The first test exercise was carried out by Captain Lyn Di mond, R.A.M.C., and the results of his observations are given under No. 5 in Table VI. Line A refers to the count taken after rest and immediately before exercise, Line B to the count immediately after exercise, and Line C to the count taken after the second period of rest. Chart II. gives the results of the total leucocyte counts in a graphic form.

TABLE VI.—*Patients.*

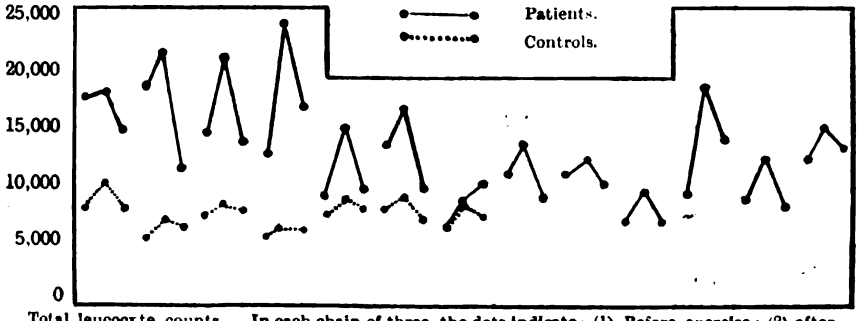
—	Date of test and week of treatment.	Units of exercise.	Time taken over exercise.	Total cells per c.mm.	Differential.				
					Polynuclears.	Lymphocytes.	Eosinophils.	Large mononuclears.	Basophils
1.—Ch.	22/8/16 4th.	12	10 min.	A. 17,600 B. 18,000 C. 14,600	A. 45·5 B. 41·5 C. 56 0	45·75 48·5 36·5	6·0 5·25 4·25	1·25 2·25 1·5	1·5 2·5 1 75
2.—Br.	31 8 16 4th.	8	10 min.	A. 17,600 B. 20,200 C. 10,300	A. 55·5 B. 60·75 C. 53·25	39·75 32·75 41·5	2·75 2·75 2·5	1·75 3·0 1·75	0·25 0·75 1·0
3.—He.	25 8 16 2nd.	20	20 min.	A. 14,500 B. 20,600 C. 13,600	A. 60·75 B. 49·25 C. 73 0	34·25 44·0 24·0	1·25 1·0 2·0	3·5 4·5 1·0	0·25 1·25 —
4.—G.	1 9 16 5th	14	10 min.	A. 12,900 B. 23,800 C. 16,800	A. 47·0 B. 46·75 C. 66·5	47·75 51·0 29·25	2·5 1·25 2·75	2·25 0·75 1·25	0·5 0·25 0·25
5.—T.	7 8 16 11th	10	15 min.	A. 9,100 B. 15,000 C. 9,500	A. 56·5 B. 55·75 C. 60·75	37·0 36·0 33·25	3·5 4·5 3·75	2·75 3·25 2·25	0·25 0 5 2·25
6.—Be.	30 8 16 3rd	10	8 min.	A. 13,400 B. 16,700 C. 9,600	A. 46·25 B. 51·75 C. 66·75	45·5 44·5 28·25	5·5 3·25 2·25	1·75 0·25 2·75	1·0 0·25 —
7.—Q.	5 9 16 7th	8	5 min.	A. 6,900 B. 8,700 C. 10,100	A. 50·25 B. 51·75 C.**	44·5 44·75 —	2·25 2·0 —	1·5 — —	1·5 1·5 —
8.—Wa.	8 9 16 6th	20	14 min.	A. 11,100 B. 13,700 C. 9,000	A. 68·75 B. 62·5 C. 67·25	28·25 32·25 30·5	1·25 3·0 1·75	1·25 0·75 0·5	0·5 1·5 —
9.—Cu.	3 10 16 1st	12	23 min.	A. 10,900 B. 12,100 C. 10,200	A. 69·0 B. 58·5 C. 65·75	28·0 39 25 31·75	1·5 2·0 0·5	1·25 0·25 1·75	0·25 — 0·25
10.—Cl.	5 10 16 3rd	20	15 min.	A. 9,000 B. 11,600 C. 9,900	A. 60·5 B. 54·25 C. 59·5	31·5 37·0 31·75	6·0 6·0 5·0	1·25 2·0 2·75	0 75 0·75 1·0
11.—Ha.	10 10 16 2nd	8	8 min.	A. 7,000 B. 9,500 C. 7,000	A. 58·5 B. 43·0 C. 62·5	36 25 52·25 34·5	2·5 2·5 1·5	1·25 1·5 0·75	1·5 0·75 0·75
12.—Wl.	7 9 16 4th	8	5 min.	A. 10,000 B. 18,200 C. 14,000	A. 65·0 B. 55·0 C. 65·75	28·5 41·0 31·25	5·25 3·5 2·0	0·75 0·25 0·75	0·5 0·25 0·25
13.—Wi.	13 10 16 10th	16	11 min.	A. 9,000 B. 12,400 C. 8,500	A. 61·75 B. 56·25 C. 62·25	33·25 38·75 33·0	3·0 3 25 2·0	1·75 1·25 2·25	0·25 0 5 0·5
14.—A.	8 12 16	10	12 min.	A. 12,500 B. 15,100 C. 13,300	A. 44·75 B. 39·0 C. 46·25	52·5 57·5 49·25	1·25 0·75 1·75	1·25 2·5 2·75	0·25 0·25 —

TABLE VII.—*Controls.*

1.—L.	17/10/16	20	11 min.	A. 8,400 B. 10,000 C. 8,300	A. 59·5 B. 57·75 C. 59·25	34·0 36·5 35·0	2·75 3·25 3·5	3·75 2·0 1·75	— 0·5 0·5
2.—R.	18/10/16	20	7 min.	A. 5,700 B. 7,000 C. 6,700	A. 62·0 B. 54·0 C. 58·5	29·25 36·0 33·75	4·75 4·75 5·0	2 5 3·75 1·5	1·5 1·5 1 25
3.—E.B.	29 9 16	20	18 min.	A. 7,500 B. 8,400 C. 8,100	A. 50·5 B. 50·25 C. 51·0	44·75 46·75 46·0	2·0 1·5 1·25	2·5 1·5 1·75	0·25 — —
4.—G.B.	9/8/16	10	10 min.	A. 5,700 B. 6,200 C. 6,200	A. 61·5 B. 58·25 C. 61·75	32·75 36·25 33·25	2·75 2·0 1·5	2·75 3·25 3·0	0·25 0·25 0·5
5.—M.	12 10 16	20	15 min.	A. 7,700 B. 8,900 C. 8,000	A. 63·75 B. 65·0 C. 63·0	31·0 30·5 32·0	1·5 2·5 2·25	3·0 1·0 2·0	0·75 1·0 0·75
6.—B.	27/9/16	20	18 min.	A. 8,100 B. 8,800 C. 7,300	A. 60·25 B. 61·5 C. 69·25	34·75 34·5 27 25	2·0 1·0 1·0	2·5 2·25 2·0	0·5 0·75 0·5
7.—St. J.	14 11 16	20	20 min.	A. 6,600 B. 8,700 C. 7,600	A. 53·75 B. 49·75 C. 55·75	39·25 45·75 40·5	3 5 1·75 0·25	2·75 2·25 3·0	0·75 0·5 0·5

** Not counted.

CHART II.



Total leucocyte counts. In each chain of three, the dots indicate: (1) Before exercise: (2) after exercise; (3) after rest 1 to 1½ hours.

It will be noted that the first two patients do not show a big rise in leucocytes after exercise, though the levels of the counts are high, but they do show a fairly large fall after rest. These two men did not have the preliminary hours' rest, but were walking about the wards. Therefore the

numbers given in Line C probably represent their leucocyte counts at rest more accurately than the numbers in Line A. It was after these two estimations had been made that the preliminary hour's rest was adopted in the test.

The average total count before exercise is 11,535, the average after exercise is 15,400. The average rise is therefore 33·6 per cent. If the first two men are omitted for the reason given above, the average rise is 40·4 per cent. The maximum individual rise is 84 per cent.

The average count in the controls before exercise was 7100 per c.mm., after exercise 8200, an average rise of 15·4 per cent.

Estimations of the leucocyte rise in normals after muscular exercise by other observers all refer to much more strenuous exercise than the staircase test. For instance, P. B. Hawk[3] estimated the total leucocyte counts before and after athletic competitions and training races. The exercise varied from a 100-yards sprint to a two-mile run. He found an average increase of 57 per cent., the maximum individual increase being 104·4 per cent. after three minutes' water polo. Hawk quotes the work of Willebrand,[4] who employed 12 athletic young men for his test. He gave them gymnastic exercises for 10 minutes, and did blood counts before exercise, immediately after, and again 1 to 1½ hours after. He found an increase in the leucocytes varying from 19·2 to 96·9 per cent., the average being 47 per cent. Neither of these observers appears to have done differential counts. Larrabee[5] also estimated the rise in leucocytes in four cases after a road race of 25 miles. The leucocytosis varied from 14,400 to 22,200 per c.mm.

Effect of exercise on the differential count.—The most constant change observed in the differential count was a rise in the lymphocytes immediately after exercise, and a fall of the same after a rest.

Ten cases showed a rise in the percentage of lymphocytes after exercise, one case showed a fall of lymphocytes of 7 per cent., three cases showed no change (1 per cent. or less). Of these three cases, two showed a fall of lymphocytes after rest; the remaining case was not counted for the third time. Only one case, therefore, differed from the general type—i.e., a rise of lymphocytes after exercise, a fall after rest. Some of the differences were small enough to come within the margin of error. Assuming that a rise or fall of more than 8 per cent. is outside the limits of error and therefore represents a real change in the composition of the blood, we find that five cases show changes within 8 per cent., eight cases show changes of the usual type of over 8 per cent. (maximum change 23·75 per cent.), one case shows a change of the opposite type (i.e., 7 per cent. fall of lymphocytes after exercise and a rise of 8·75 per cent. after rest). In four of the cases the percentage lymphocyte count rose above the polynuclear percentage after the exercise, the lymphocyte counts being 51, 52·25, 48·5, and 57·5 per cent.

Absolute Numbers of Leucocytes Before and After Exercise.

TABLE VIII.—*Patients.*

—	A, before exercise.				B, after exercise.				C, after rest 1-1½ hours.			
	Polynuclears.	Lymphocytes.	Eosinophils.	Large mononuclears.	Polynuclears.	Lymphocytes.	Eosinophils.	Large mononuclears.	Polynuclears.	Lymphocytes.	Eosinophils.	Large mononuclears.
1.—Ch.	8008	8052	1056	220	7470	8730	945	405	8176	5329	620	219
2.—Br.	9768	6996	484	308	12271	6615	555	606	5484	4274	257	180
3.—He.	8808	4966	181	507	10145	9064	206	927	9928	3264	272	136
4.—Ga.	6063	6159	322	290	11128	12138	297	178	11172	4914	462	210
5.—To.	5147	3367	318	250	8362	5400	675	487	5771	3144	356	214
6.—Be.	6197	6097	737	234	8642	7431	542	41	6408	2712	216	264
7.—Q.	3467	3070	155	103	4502	3893	174	130	—	—	—	—
8.—Wa.	7631	3135	138	138	8562	4418	411	102	6052	2745	157	45
9.—Cu.	7521	3062	163	136	7078	4749	242	30	6706	3238	51	178
10.—Cl.	5445	2835	540	112	6293	4292	696	232	5890	3143	495	272
11.—Ha.	4095	2537	175	87	4085	4963	237	142	4375	2415	105	52
12.—Wi.	6500	2850	525	75	10010	7462	637	45	9205	4375	280	105
13.—Wi.	5557	2992	270	157	6975	4805	403	155	5291	2805	170	191
14.—Al.	5594	6563	156	156	5889	8682	113	377	6151	6550	233	366
Average...	6414	4476	372	198	7957	6617	438	276	6969	3762	282	387

TABLE IX.—*Controls.*

1.—L.	4998	2856	231	315	5775	3650	325	200	4917	2905	290	145
2.—R.	3534	1667	270	142	3780	2520	332	262	3919	2261	335	100
3.—H. B.	3787	3356	150	187	4221	3987	126	126	4131	3726	101	141
4.—G. B.	3506	1886	156	156	3611	2247	124	201	3828	2061	93	186
5.—M.	4906	2387	115	231	5785	2714	222	89	5040	2560	180	160
6.—B.	4860	2835	162	222	5436	3050	88	200	5100	2000	74	146
7.—St. J.	3538	2591	231	148	4328	2980	152	196	4237	3078	19	22
Average ...	4162	2508	187	200	4705	3155	195	182	4453	2655	156	158

In the controls five showed a rise of lymphocytes after the exercise, two showed no change. In none of the controls was the variation greater than 7 per cent. Assuming, as before, that a rise or fall of less than 8 per cent. comes within the margin of error, it is difficult to say that there is any definite change in the proportions of the different cells after exercise.

Observations carried out by Captain Lyn Dimond showed approximately the same results. He made 11 observations on six patients before and after a staircase exercise. The total counts were not estimated. The differential counts showed that in nine observations there was a rise in the percentage of lymphocytes after exercise, in one observation there was no change, in the remaining case there was a fall of 11·5 per cent. in the lymphocytes. Of the nine observations showing a rise in lymphocytes, five gave a rise of 8 per cent. or over (maximum 14·5 per cent.), four gave a rise of less than 8 per cent. (2·5 to 5·5 per cent.).

As it has been demonstrated that all the cases show a rise in total leucocytes after exercise, and at the same time a majority show a percentage rise in lymphocytes, it follows that the increase in the number of white cells is largely composed of lymphocytes. Tables VIII. and IX. give the absolute numbers of the different cells in patients and controls in the exercise test. Basophils are omitted as the numbers are too small to be of any value. Taking the average of all the cases, the rise in polynuclears after exercise is 24 per cent., but the rise in lymphocytes is 48 per cent. Eosinophils and large mononuclears are both slightly increased in number after exercise, so that the leucocytosis is a mixed one, but the lymphocytes form the chief part of the increase. In the controls the rise in polynuclears after exercise is 13 per cent., the rise in lymphocytes 25 per cent.

In the next section the changes in the lymphocyte percentages will be noted more particularly, as the variations chiefly occur in them.

Clinical Symptoms of the Patients Tested by the Staircase Exercise.

No. 1, Ch.—Aged 26. History of chorea at 9 years of age. This patient had seen service in France. The onset of his symptoms had been gradual, dating back four years. He showed the usual symptoms of "irritable heart." He made no progress under treatment, and was discharged as permanently unfit. This patient did not have a rest before the exercise began, and therefore showed a high initial leucocyte count—viz., 17,600 per c.mm. The high level of all the leucocyte counts and the change in the percentage of lymphocytes (12 per cent.) would mark this case as a severe one, judging solely from the condition of the blood.

No. 2, Br.—Aged 22. No history of previous infection, service in France. Onset of symptoms had been gradual after service in the trenches. At the time of examination the patient showed the full symptoms of D.A.H. He made no progress, and was discharged as permanently unfit. This man also did not have the preliminary rest, and his initial count was 17,600 per c.mm., with a rise to 20,200 per c.mm. after exercise, and a rest count of 10,360 per c.mm. He showed a slight fall in lymphocytes, 7 per cent. after exercise instead of the usual rise, but the change is sufficiently small to come within the margin of error. Judging from the total leucocyte count the case is a severe one.

No. 3, He.—Aged 19. History of rheumatic fever in 1911. No service abroad. Onset of symptoms gradual since childhood, worse since rheumatic fever. The full symptoms of D.A.H. were present. He made no progress, and was discharged as permanently unfit. The two leucocyte counts taken after rest were practically identical—viz., 14,500 and 13,600. The count after exercise was 20,600. The lymphocytes showed a typical rise of 10 per cent. after exercise and a fall of 20 per cent. after rest. These two points, the 42 per cent. rise of total leucocytes and the 20 per cent. change in lymphocytes, mark the case as a severe one.

No. 4, G.—Aged 24. History of frequent sore-throats. No service abroad. Onset of symptoms gradual, dating back several years. He showed the full symptoms of D.A.H., made no progress, and was discharged as permanently unfit. From the hæmatological point of view this case was the most severe of the series. The total leucocyte count showed a rise of 84 per cent. after 14 units of exercise up to 23,800 per c.mm., and the lymphocytes showed a small rise after exercise, but a fall of 21·75 per cent. after rest.

No. 5, T.—Aged 18½. History of scarlet fever and diphtheria in childhood. Service in France. Onset of symptoms gradual during many years. Full symptoms of D.A.H. were present and the heart was enlarged. He made no progress and was discharged as permanently unfit. This patient showed a rise of 65 per cent. in the total count up to 15,000 per c.mm. His differential count showed little variation, the lymphocytes showing a fall of 2·75 after rest and the polynuclears a rise of 5 per cent. Although the differential count does not give any definite indication, the big rise in the total leucocytes marks the case as severe.

No. 6, Be.—Aged 21. History of scarlet fever and rheumatism in 1907. No service abroad. Onset gradual since illness in 1907. The full symptoms of D.A.H. were present. The patient made no progress and was discharged as permanently unfit. This patient had a total count of 16,700 per c.mm. after exercise and a count of 9600 after the second rest. The percentage of lymphocytes showed no change after the exercise, but a fall of 16·25 per cent. after a rest. Therefore the case was regarded as a severe one.

No. 7, Q.—Aged 24. History of tonsillitis in 1914. No service abroad. Had had symptoms for many years. He did not show any improvement and was discharged as fit for sedentary work. Although this patient did not show any improvement, his case was considered to be, clinically, one of the least severe of the series, and there was a suspicion that he was making the most of his symptoms. This case from the

hæmatological point of view did not show any characteristic points, except that the lymphocyte count was somewhat high, 44·5 per cent. All the total counts fell within normal limits, only a rise from 6900 to 8700 per c.mm. after exercise being noted. The differential counts before and after exercise were practically identical. This patient only did a short exercise, four times the two flights of stairs, as he said he could not go on, though he showed no objective signs of distress. It was noted at the time that he made no attempt to exert himself.

Two views may be taken of this patient. First, that he was a genuine slight case of D.A.H., but did not exert himself sufficiently to show the characteristic changes, against which view is the normal total count after slight exercise, and in favour of it the relatively high lymphocyte counts. Second, that this case was not a genuine one of D.A.H., and that the blood counts confirmed the clinical suspicion of malingering.

No. 8, Wa.—Aged 19. History of chronic suppuration and otitis media. Service in France. Onset of symptoms sudden, following bombardment. His symptoms of D.A.H. were mild, he made slight progress, and was discharged in category "a" (fit for general service). This case showed a small rise in total leucocytes after exercise, from 11,100 to 13,700 per c.mm. There was little change in the differential count the lymphocytes rose 4 per cent. after exercise and fell 2 per cent. after. There was no lymphocytosis, the highest reading being 32·25 per cent. Here the blood picture appears to confirm the clinical diagnosis of a mild case.

No. 9, Cu.—Aged 21. No history of previous infection. Service in France and the Dardanelles. Symptoms came on after four months' service in France and after "malaria" and dysentery. He showed the usual symptoms, but improved under treatment. This patient did not show very marked changes in the blood. The leucocyte count at rest was 10,900 and after exercise 12,100. The lymphocytes rose 11 per cent. after exercise and fell 7·5 per cent. after rest. The highest lymphocyte reading was 39·25 per cent. From the blood findings the case should be classed as a mild one.

No. 10, Cl.—Aged 24. History of "brain fever" as a baby. Service in France. Onset of symptoms gradual after one year in France. He showed the usual symptoms, which improved slightly, but he was only able to proceed to the higher exercises with difficulty. This patient only showed a moderate rise in leucocytes after exercise —viz., 9000 to 11,620. His lymphocytes rose 5·5 per cent. after exercise and fell 5·25 per cent. after rest. He was therefore classed at a mild case. The first test was carried out in the third week after admission. In the seventh week the test was repeated, except that the third estimation was not carried out. Very little change was observed. The leucocytes rose from 9,700 to 11,700 per c.mm., and the lymphocytes rose 3·25 per cent. The highest lymphocyte reading was 37 per cent. on the first date, and 33.25 per cent. on the second. From the blood findings the patient had made no improvement, though the variations are not very marked.

No. 11. Ha.—Aged 19. History of whooping cough, chicken-pox, tonsillitis. No service in France. Symptoms for several years. He showed the full symptoms of D.A.H., made no progress, and was discharged as permanently unfit. This case is interesting, as the leucocyte count at rest was normal, 7,000, rose to 9,500 per c.mm. after exercise (he only did eight units of exercise), but his lymphocytes showed a big rise from 36·25 to 52·25 per cent., and fell again after exercise to 34·5. The absolute numbers show that the increase in leucocytes was almost entirely due to lymphocytes, the polynuclear numbers remaining practically stationary, so that the readings after exercise were 40·5 polynuclears and 4963 lymphocytes. From this case it would appear to be necessary to do a differential count as well as a total count in the test exercise, otherwise the lymphocytosis and big variation in percentages would not be noticed.

Nos. 12 and 13 Wi.—The two estimations refer to the same patient. The first was made in the fourth week after admission, the second in the tenth week. Aged 24. No history of previous infections. Service in France. Onset of symptoms gradual after one year in France. His symptoms were moderate. He made considerable progress while in hospital, and was discharged in category "a." On the first occasion patient could only do 8 units of exercise. The rest count was 10,000, after exercise 18,200. The lymphocytes rose 12·5 per cent. and fell 9·25 per cent. after rest. These findings would mark the case as severe. Six weeks later the test was repeated; this time the patient did 16 units of exercise. The total count rose from 9000 to 12,400 and the lymphocytes rose 5·5 per cent. On these findings alone the case would be classed as mild. Two weeks later, just before the patient's discharge, when he was sufficiently fit to do route marches, an estimation was done without any preliminary rest or exercise. The total count was 7300 per c.mm. and the polynuclear percentage 59. This case seems to indicate that the condition of the blood varies with the general progress, and that one test exercise is not of much value in the prognosis, although it may be useful for diagnosis.

No. 14, A.—Aged 22. Symptoms for several years. No history of previous infection. Service in Mesopotamia. Present symptoms of moderate severity; no progress. This patient had a high lymphocyte count throughout. He was found to be a carrier of *Entamœba histolytica*. He showed the characteristic change in the blood after exercise.

A list of these patients drawn up by the clinicians in accordance with the severity of the symptoms was compared with a similar list based on the blood findings. The correspondence between the two methods of classification was very close.

The four most severe cases by clinical standards showed the highest total leucocyte counts after exercise (18,000 to 23,800), the four least severe cases showed only a moderate leucocytosis after exercise (8700 to 13,700). The remaining cases were intermediate to the above groups both in the severity of their symptoms and in the degree of leucocytosis (9500 to 18,000). A big rise in the lymphocyte percentage after exercise was regarded as a sign of some severity, even if the total count was below 10,000 per c.mm.

An analysis of these cases demonstrates that the men who have a history of symptoms dating back many years show a higher lymphocyte count than the men who date their symptoms as subsequent to service abroad.

The cases may be divided into two classes: In Class A, in which the onset of symptoms dates back to civilian life, the highest lymphocyte counts are respectively, Case 1, 48·5 per cent.; Case 3, 44 per cent.; Case 4, 51 per cent.; Case 5, 37 per cent.; Case 6, 45·5 per cent.; Case 7, 44·75 per cent.; Case 11, 52·25 per cent.; Case 14, 57·5 per cent. The average is 47·5 per cent. In Class B, in which the onset of symptoms is dated from the strain of actual service in the trenches, the highest lymphocyte counts are respectively, Case 2, 41·5 per cent.; Case 8, 32·25 per cent.; Case 9, 39·25 per cent.; Case 10, 37 per cent.; Case 12, 41 per cent. The average is 38·2 per cent. In the controls the average of the highest lymphocyte counts is 38·2 per cent. Of the first class, A, three of the eight men had served abroad, six were discharged as permanently unfit, one case, No. 7, in which there was a suspicion of malingering, was discharged in category "d," and one is still in hospital. In the second class, B, all had served abroad, three of the five men were discharged in category "a," one as permanently unfit; the other one is still in hospital.

This classification seems to indicate that men who have shown signs of "unfitness" in civilian life are very liable to break down while still in training, and are not likely to improve much under treatment, while the men who have passed through their training successfully and then break down under the strain of foreign service are likely to obtain considerable benefit from treatment.

Diagnosis.—Patients with conspicuous symptoms of "irritable heart" show in nearly every case a moderate leucocytosis. Patients with slight symptoms may only show the leucocytosis after moderate exercise. The same amount of exercise in normal individuals will produce a smaller response. Patients with symptoms of long standing are more apt to show a higher lymphocyte count than those with symptoms of recent origin. This, however, is not invariable, as the patient who showed the most marked degree of lymphocytosis had a history of only six weeks' duration. The percentage rise in lymphocytes may be considerable in patients who do not show any appreciable rise in the number of leucocytes after exercise. It is therefore necessary to estimate both the total and differential counts if the effect of exercise is to be used as a point in diagnosis. As a help in diagnosis it is suggested that the following test should be carried out.

The patient should be made to perform an amount of muscular work equivalent to the staircase exercise, and his total and differential counts estimated immediately afterwards. He should then lie down for an hour while the counts are in process of estimation. If the total count is below 11,000, and the lymphocyte count is below 45 per cent., he can be regarded as negative, and a second count is unnecessary. If, however, the total count is below 11,000, but the lymphocyte count above 45 per cent., a second estimation should be made after an hour's rest. If the total count immediately after exercise falls between 11,000 and 14,000 per c.mm., the condition may be regarded as mild, when the count falls above 14,000 as moderately severe. If after exercise the total count is below 11,000, but the lymphocyte count is high (above 45 per cent.), and after rest shows a big percentage fall (10 to 20 per cent.) the case may be regarded as moderately severe.

A few illustrations will show how the test can be shortened in practice. Nos. 1, 2, and 3 were three consecutive patients sent up to the hospital for diagnosis. No. 1 did 20 units of exercise; his total count immediately after was 8600 per c.mm. and his percentage of polynuclears 62. The findings were negative and no further examination was done. No. 2 did 12 units of exercise; his total count immediately after was 16,700 per c.mm.; this alone was sufficient to class him as a moderately severe case. No. 3 did 20 units of exercise; his total count after was 12,000 per c.mm., polynuclear percentage 77. He was regarded as a mild case. In each instance the clinical findings agreed with the findings based on the leucocyte estimations.

It cannot be said definitely that a normal blood count in these patients excludes a diagnosis of "irritable heart." On the other hand, a blood count which shows a marked deviation from the normal is a positive sign entirely outside the control of the patient, and may be regarded as a definite objective point in diagnosis. The blood count does not give much help in prognosis, as the condition of the blood appears to vary with the general condition, and this can be judged by the usual clinical methods.

The degree of lymphocytosis present in many of these cases appears to bear out the statement of Curschmann[6] that a high lymphocyte count is indicative of a "substandard" constitution. This author only gives percentages from the differential count, and does not make any statement as to the total number of leucocytes present in his cases.

Summary.—The following conclusions apply to patients who show the signs and symptoms referred to at present under the term "irritable heart."

1. At absolute rest there is a slight leucocytosis or no leucocytosis.

2. While up and about there is a decided leucocytosis. In many, and especially in cases of long standing, there may be a relative and absolute lymphocytosis.

3. The variability of the different kinds of leucocytes is greater (more than double) than in normal individuals.

4. The response to muscular exercise is similar to that found in healthy subjects, but is exaggerated in its degree. This exaggerated response can be used as an objective sign in diagnosis.

5. The degree of leucocytosis and of variability in percentages after exercise is proportionate to the severity of the symptoms.

Addendum.

The error of differential counts.—The question of making a reasonably accurate differential count presented some difficulty. Owing to the fact that many of the preparations had to be made at different times of the day and by different individuals, it was necessary to depend upon a dried film as a routine. Also the object in view was to devise a method which could be carried out as a clinical test. Thus in the test exercise described above three estimations of total leucocytes and three differential counts had to be carried out, so that the smallest number of cells compatible with reasonable accuracy were counted. Four hundred cells were counted as a routine, and an attempt was made to estimate the margin of error by the method used. The films were spread by one slide upon another. This method undoubtedly exercises a selective action, some of the larger leucocytes being carried along to the edge of the film. A large error is possible by simply counting down the middle of the films. The routine adopted was to count 400 cells—100 down the middle, another 100 right across the slide, another along one of the sides, and another at the end of the film. This method of distributing the count appeared to be satisfactory, as the same slides counted by two observers gave approximately the same results.

Comparison of wet and dry counts.—The error was estimated by counting a dry film against a wet preparation. Dry and wet films were prepared simultaneously, and 400 cells were counted in each by two observers independently, and the results compared, the count in the dry film being distributed as described above. The wet film was prepared in the following manner, the procedure being a combination of the wet counting methods recommended by A. G. Phear[7] and Hill.[8] The stain was prepared according to Hill's method, except that Jenner's stain was found to be as good as, if not better than, Wright's for the purpose. One soloid stain (Wright or Jenner) was dissolved in 10 c.c. of pure methyl alcohol. The actual diluent was made up fresh each day from this stock solution in the following proportions: Distilled water, 12 parts; acetone, 3 parts, methyl alcohol, 1 part; stain (filtered), 4 parts. The mixture must be thoroughly shaken.

A small drop of blood is picked up on a slide, a small quantity of the diluent dropped on it, and the blood is mixed with the stain by blowing a current of air on to the surface of the drop through a pipette. This mixing must be done quickly, otherwise the acetone will evaporate and the eosin-methylene blue combination will be precipitated. The least trace of acidity will cause precipitation. The drop is covered quickly by a cover-slip, the under surface of which has been previously rimmed with liquid parolein for one-eighth of an inch. The leucocytes can be easily recognised and counted with a 1/8 in. objective. The details are seen best with a 1/12 in. objective, the light being considerably reduced. The eosinophils stand out brilliantly, the granules stain a deep crimson and are so prominent that the nucleus is almost obscured. In the polynuclears the protoplasm takes up a pinkish colour and the granules are very noticeable. The shape of the nucleus is not so clearly defined as in a dry film. The large mononuclears are distinctive, appearing as large oval cells with a relatively small kidney-shaped nucleus, the protoplasm having a distinct bluish tinge. In the lymphocytes the protoplasm is practically colourless.

Six consecutive parallel counts carried out by two observers independently gave the following results, 400 cells being counted in each. Nos. 1 and 2 from a control. Nos. 3 to 6 from 2 patients. (Table X.)

TABLE X.—*Comparison of Wet and Dry Films.*

	Wet Counts. (Counted by Observer A.)					*Dry Counts.* (Counted by Observer B.)				
	Differential count, 400 cells.					Differential count, 400 cells.				
No.	Poly-nuclears.	Lympho-cytes.	Eosino-phils.	Large mono-nuclears.	Baso-phils.	Poly-nuclears.	Lympho-cytes.	Eosino-phils.	Large mono-nuclears.	Baso-phils.
1	64·5	32·25	1·0	2·25	0	65·0	30·5	2·5	1·0	1·0
2	64·0	32·75	2·0	1·25	0	63·0	32·0	2·25	2·0	0·75
3	58·0	34·0	5·0	2·5	0·5	61·75	33·25	3·0	1·75	0·25
4	55·0	37·0	4·5	3·0	0·5	56·25	38·75	3·25	1·25	0·5
5	62·0	31·0	3·25	3·0	0·75	62·25	33·0	2·0	2·25	0·5
6	45·0	45·5	5·25	3·5	0·75	48·0	44·0	4·0	3·0	1·5

Taking the wet counts as a standard, the dry counts show an average error of 1·5 per cent., with a maximum error of 3·75 per cent. That the cells are evenly distributed in the wet films can be proved by comparing the numbers of polynuclears in the different hundreds. Thus, in one wet film, 400 cells were first counted at random. The percentage of polynuclears was 64·5. Then an attempt was made to count every cell in the film (over 3200). The percentage was 64·37, and the eight successive lots of 400 each gave percentages of 60·5, 67, 64, 63·25, 60·75, 68·25, 65, and 66·25. The chances of error may be gauged from the following statement taken from statistical tables[9]: given a count of 403 leucocytes, and an observed percentage of 39 lymphocytes, the chances are 9 to 1 that the error will fall within 4 per cent.—i.e., that the truth will lie between 35 per cent. and 43 per cent. Throughout the paper the probable margin of error has been considered to be 4 per cent. in a differential count of 400 cells.

In conclusion, I wish to acknowledge my indebtedness to Captain Lyn Dimond, R.A.M C., for his help in carrying out the investigation, and also to Miss I. B. Matthews, of Toronto, for the great assistance she has given in making many of the differential counts.

References.—1. H. C. Ward: American Journal of Physiology, 1904, xi., 394. 2. A. G. Phear: Med. Chir. Trans., 1899, lxxxii.; THE LANCET, 1899, i., 1157, 1361. 3. P. B. Hawk: American Journal of Physiology, 1904, x., 384. 4. Willebrand: Skand. Archiv für Phys., 1903, xiv., 176. 5. Larrabee: Journal of Medical Research, new series, 1902, ii., 76. 6. Curschmann: Med. Klin., No. X., March 5th, 1916. 7. A. G. Phear: Loc. cit. 8. R. A. P. Hill: THE LANCET, 1912, i., 20. 9. R. Ross and W. Stott: Annals of Tropical Medicine and Parasitology, 1911, v., 347.

THE INFLUENCE OF MATERNAL ORAL SEPSIS ON THE FŒTUS AND MARASMIC CHILDREN.

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AT a time like the present, when the children of the British Empire are such an imperial necessity and asset to the nation, it is the aim of every medical man to do all in his power to enable those children to be as healthy and vigorous as possible; therefore it appears opportune to call attention to a condition of maternal oral sepsis and its resulting evils upon the children that has not received any attention from the medical world before the present investigations were undertaken, so far as I am aware. For the past nine years observation has been kept by myself upon marasmic children and their mothers, and also those children who, being breast-fed, yet suffered from vomiting and diarrhœa, and the conditions of the mothers' mouths carefully noted. The clinical evidence strongly points to the septic condition of the mother's mouth having a very marked effect upon both the fœtus and the post-natal condition of the child. The cases examined do not include such obvious causes as syphilis and other well-known conditions, that are universally admitted to cause stunting in growth or wasting in children, &c., but are all cases where clinically nothing of a pathological condition was found in the mother other than in the mouth. In some cases, however, the mother's milk rapidly failed; later in this article this matter will be discussed.

All the cases examined, and of which notes were made, were first examined by physicians as to their condition, and then

referred to the author as being more or less obscure, and about whom nothing definite was known. In an article by Dr. J. W. Ballantyne [1] he says:—

"It has been shown that in the lower animals the placenta has a real affinity for some toxic bodies, and by storing them up in its substance prevents them passing to the fœtus. In this respect it resembles the action of the liver in the adult, being an accumulator of poisons. Of course, it does not necessarily prevent their passage, although it may store them up. Bacteriological researches have shown that through it can pass the bacillus of anthrax, of fowl cholera, typhoid fever, the pneumococcus, the streptococcus, the spirillum of Obermeier, the bacillus of glanders, the pathogenic organism of hydrophobia, and, perhaps, the hæmatozoon of malaria. So we have now to look at the opposite side of the question, viz., the placenta as a means of access of germs and toxins to the fœtus. It would seem also that it is not necessary for the placenta to be macroscopically diseased, as by hæmorrhage into its substance, in order that the organisms may pass; in fact, in some cases in which the germs have passed the placental tissue does not appear to have been even microscopically affected. The fact that it is through the placenta that infection reaches the fœtus has an important bearing upon the primary lesions in the fœtus. The germs and toxins arrive at the body in the blood, passing first through the placenta and umbilical vein, then either through the liver or ductus venosus, then through the heart, and so to the whole circulation. Erysipelas in the mother has been found associated with streptococcic endocarditis in the fœtus and not with erysipelatous inflammation of the fœtal skin (reported by Bidone). Atrophic conditions of the subcutaneous tissue are sometimes found as congenital states."

Now, if these conditions have been demonstrated and certain well-defined micro-organisms found in the fœtus, logically the toxins from the maternal septic mouth should also produce their effect on the fœtus by the same means of transmission. On the other hand, the mother may herself acquire a certain amount of immunity by antibodies from her own toxins, and that would explain the birth of certain healthy and vigorous children in spite of the maternal oral sepsis.

Stress is laid upon the term oral sepsis, as certain of the mothers' mouths showed the teeth to be well formed, free from caries, and with all the teeth *in situ*. In many cases where the mother had several children there was found a progressively increasing change for the worse in the health and vigour of the younger children of a greater degree of intensity than one would expect to find as the result of repeated pregnancies, suggesting other agencies at work than the natural exhaustion of the mother, and explicable on the ground of a successively increasing toxæmia. The following cases will give some data for arriving at certain definite conclusions, but it must be understood that these cases are just ordinary ones occurring in hospital practice, as all the material for this article has been obtained from patients attending the East London Hospital for Children, Shadwell, and the Prince of Wales's General Hospital, Tottenham, and not from private practice.

CASE 1.—Male, aged 8 weeks. Marasmus. Weight 10 lb. 4 oz. Breast-fed. Vomits after each feed. Motions curdy. Very flatulent. Condition of mother's mouth: Very septic; teeth [2] $\frac{8^{***}\ 7^{***}\ 4}{8\ \ 7\ 6\ 5\ 3}\ |\ \frac{5^{*}\ 7^{*}\ 8^{***}}{3\ 4\ 5\ 7\ 8}$ all badly carious and septic. Had six children, two living, including the patient, and four dead. Eldest and youngest alive. Mother fed children on breast for first few weeks; then on bottle, as her milk went.

CASE 2.—Male, aged 2½ months. Marasmus. Weight 6 lb. 2 oz. Breast-fed for first two weeks; Nestlé's milk after. Condition of mother's mouth: Very septic; salivary calculus; pus and chronic gingivitis round all teeth. $\frac{6^{***}\ |\ 6}{6\ \ \ 5\ |\ 6}$ carious. Mother had eight children, three living, five dead. The patient was the first marasmic child, according to the mother's statement. Mother's milk went soon after she got up with all the earlier children; last three children breast-fed. The two born immediately before the patient had died. Mother aged 34; father 33, healthy.

CASE 3.—Male, aged 10 weeks. Marasmus; weight 5 lb. 14 oz. Bottle-fed from birth. Condition of mother's mouth: Oral sepsis; teeth good except $\frac{|\ 2}{6\ |}$ carious. Chronic gingivitis. Salivary calculus and pus round necks of teeth. Had five children. Child immediately before this one, dead: others alive and healthy. Dead child marasmic; breast-fed. Mother aged 27; father 28, healthy.

CASE 4.—Male, aged 5 months. Marasmus. Breast-fed. Condition of mother's mouth: Oral sepsis; chronic interstitial gingivitis and débris of food at necks of teeth; septic roots of $\frac{|}{6^{**}\ 5^{*}\ |}$; teeth good and well formed. Mother was advised to have her mouth treated but refused, so advised that child should be taken off breast and artificially fed. Mother had nine children, four dead, five living. Child older than the patient, aged 2 years, wasted until 14 months old, when it was taken off the breast. Second and third children breast-fed for five months and died of marasmus.

CASE 5.—Female, aged 5 months. Marasmus; weight 8 lb. 5 oz. Breast-fed. First child. Always sick after breast, almost immediately. Condition of mother's mouth: Oral sepsis; salivary calculus and pyorrhœa alveolaris round lower incisors; some chronic gingivitis round upper teeth. Teeth good. No caries; $\frac{|}{6\ 5\ |}$ have been extracted. Mother aged 20; father 22, healthy.

CASE 6.—Male aged 4 months. Marasmus; weight 6 lb. Breast-fed for three months, then milk and barley-water. Had diarrhœa last four weeks. No vomiting. Child died in hospital. Post-mortem report: "All viscera normal as far as could be ascertained." Condition of mother's mouth: Very foul and septic. Would not allow a proper examination to be made. Much pus could be squeezed out round lower incisors by finger.

CASE 7.—Male, aged 12 months. Marasmus; weight 11 lb. 8 oz. Breast-fed. Condition of mother's mouth. Very septic, pyorrhœa alveolaris at incisor region. Teeth: $\frac{7^{***}\ |\ 6^{***}\ 7^{***}}{|}$, all suppurating. Had six children altogether, four living (aged 10, 9, and 5 years, and the patient). The two children born immediately before the patient had died from marasmus. Mother, aged 36.

CASE 8.—Male, aged 6 weeks. Marasmus; weight 8 lb. Breast-fed. Condition of mother's mouth. Terribly septic, all teeth bathed in pus. Teeth in mouth:—

$$\frac{8\ 7\ 6^{***}\ 5\ 4\ 3\ 2\ 1\ |\ 1\ 2\ 3\ 4\ 5^{*}\ 6\ 7}{8\ \ \ \ \ \ \ 5\ 4\ 3\ 2\ 1\ |\ 1\ 2\ 3\ 4\ 5\ \ \ \ \ 8^{*}}$$

Had five children altogether; eldest healthy, fourth child sickly, and fifth the present one. Second and third children died at the age of 9 months of marasmus. Mother's age 37.

CASE 9.—Male aged 2 months. Marasmus; weight 9 lb. Twin brother of patient in hospital for "wasting." Both breast-fed. Condition of mother's mouth: Very septic; full of septic roots. All the teeth decayed and on level of gum as roots, and mostly suppurating. Never had any extracted. Had five children altogether, eldest healthy; second not so strong, third sickly. Mother aged 32.

CASE 10.—Female aged 3 months. Marasmus; weight, 5 lb. 2 oz. Breast-fed. Vomits immediately after feed. Two weeks in hospital, then died. Condition of mother's mouth: Oral sepsis; teeth *very* good; severe chronic interstitial gingivitis; food débris (old) round necks of teeth and subgingival calculus; no pus. Oral sepsis for want of toothbrush. Has two children (living and healthy) besides the patient, both breast-fed. Mother aged 22 years and 10 months; father 31, healthy.

CASE 11.—Male aged 3 years and 9 months. When first brought up for treatment was marasmic. Breast-fed. Taken off breast and artificially fed. Now fine healthy boy. Mother's mouth very septic when first seen. Full of suppurating roots, which have all been removed and mouth treated.

CASE 12.—Female, aged 2 months. Marasmus; weight 6 lb. 6 oz. Breast-fed. Condition of mother's mouth: Full of septic roots and pyorrhœa alveolaris. The patient was the only child. Mother aged 26; father 31, healthy.

CASE 13.—Male, aged 3 months. Marasmus; weight 7 lb. 2 oz. Breast-fed. Condition of mother's mouth: Full of very septic roots and teeth. Two other children, aged 2 and 3 years; eldest healthy, second not so strong.

CASE 14.—Male, aged 4 months. Marasmus. Breast-fed. Condition of mother's mouth: Oral sepsis; $\frac{8^{***}\ 2^{*}\ |\ 2^{*}7^{***}8^{***}}{8^{**}5^{*}4^{*}\ |\ \ \ \ \ \ \ \ 8^{**}}$ carious and septic; some gingivitis. Four living and healthy children besides the patient. Father healthy.

CASE 15.—Female, aged 10 weeks. Marasmus; weight at birth 9 lb.; present weight 8 lb. 2 oz. Bottle-fed from birth. Condition of mother's mouth: Pyorrhœa alveolaris; carious and septic teeth $\frac{7\ 6\ 4\ |\ 6}{8\ 7^{**}\ |\ 7^{**}\ 8^{*}}$. Had 12 children altogether; five alive, all bottle-fed. Father healthy.

[1] "Pathology of Pregnancy," Green's Encyclopædia of Medicine.
[2] An * after a number signifies a root.

CASE 16.—Female, aged 1 year and 2 months. Marasmus. Breast-fed. Wasted up to the age of 8 months, then taken off breast and put on bottle. Condition of mother's mouth: Very septic; pyorrhœa alveolaris and salivary calculus. Teeth: $\frac{7^{***}\ 6^{***}\ 5^{*}\ 4^{*}\ 2^{*}}{6}$ | $\frac{2^{*}\ 4^{*}\ 6^{***}\ 7^{***}}{3^{*}4^{*}\qquad 8^{**}}$ carious and septic. Three more children alive, all healthy. Eldest bottle-fed, others on breast.

CASE 17.—Female, aged 6 weeks. Marasmus; weight 3½ lb. Premature child, between seven and eight months. Condition of mother's mouth: Exceptionally foul and septic. Sleeps with upper denture (vulcanite, covering palate) in mouth. Has not removed denture from mouth for 12 months. Said she was told by dentist (?) never to take it out of mouth. On removal, palatine surface of denture covered with decomposed food, &c.; very malodorous. Palate very inflamed and covered with ulcerating patches; four carious teeth in mouth. Six children living and healthy; one (next to patient) dead (marasmus); all breast-fed.

CASE 18.—Male, aged 7 weeks. Marasmus; weight at birth, 10 lb.; present weight, 6 lb. Breast-fed. Condition of mother's mouth: Oral sepsis; pyorrhœa alveolaris round lower incisors. Teeth: $\frac{6^{*}\ 4^{*}\ 1^{*}}{4^{*}}$ | $\frac{1^{*}\ 2^{*}\ 3^{*}\ 4^{*}\ 5^{*}}{\qquad}$ all carious and septic. Had four children and one miscarriage. Miscarriage before birth of patient, 18 months ago. Also boy of seven months died half an hour after birth. All children breast-fed; two eldest children healthy. Mother aged 33; father 37, healthy.

CASE 19.—Female, aged 13 months. Marasmus. Breast-fed until the age of 3 months; bottle-fed since. Condition of mother's mouth: Oral sepsis; chronic gingivitis; pus round necks of teeth. Teeth: $\frac{6\ 4^{*}}{7^{**}6^{**}}$ | $\frac{6^{**}}{8^{**}}$ carious and septic. Had three children and one miscarriage at six months before the birth of the patient. Mother's milk gradually goes when she gets up, and not then sufficient to feed children. Mother aged 29; father 29, healthy.

CASE 20.—Male, aged 3½ months. Marasmus; weight, 9 lb. 5 oz. Breast-fed. Condition of mother's mouth: Great congestion of gums; salivary calculus round teeth. Teeth: $\frac{\qquad}{4^{*}\ 5^{*}\ 8^{***}}$ carious and septic. Milk gradually went six weeks after the birth of this child. Four children besides this one, all alive and healthy.

In the analysis of these cases it will be noticed that the health of the children becomes progressively worse in the younger ones in Cases 1, 2, 3, 4, 7, 8, 9, 13, 17, 18, and 19, pointing to an increasing maternal toxæmia as the condition of the mother's mouth becomes more septic, this sepsis having an adverse effect upon the health of the children. In Case 17 the mucous membrane of the mother's mouth covered by the denture was exceedingly inflamed and covered with small areas of ulceration, the whole forming, in fact, an ideal area for the absorption of toxic material. The mother expressed herself very strongly in terms of indignation when it was suggested to her that the condition of her mouth might be the cause of her child's health and the prematurity of its birth, as she considered it clean, and a stigma had been cast upon her. Certainly the sepsis arising from the retained denture had more to do with the child's condition than anything else. In Cases 1, 2, 3, 4, 7, 8, 15, 17, and 18 one or more children were dead. It is not claimed in every case that the maternal oral sepsis was the cause of the death of all these children; but it does seem to suggest that the children were born with a vitality impaired, caused by a maternal toxæmia, and therefore the children were less resistant to the common diseases of childhood than children whose vitality is unimpaired.

In Cases 18 and 19 miscarriage occurred immediately preceding the birth of the marasmic children, and in Cases 17 and 18 there were premature children. It is well known how often the above two conditions are produced by syphilis, and if a syphilitic toxæmia is capable of producing these conditions; it is surely not unreasonable to expect certain other toxæmias to have a similar effect upon the fœtus. There is not sufficient data collected yet to be dogmatic upon this point, but it would seem as if an oral sepsis in certain cases were the deciding factor.

In Cases 5 and 10 the child vomits after taking the breast, thereby showing there is some strong disturbance in the alimentary tract, and giving evidence of a toxic condition of the mother's milk. Dr. J. Haig Ferguson, in his article on "The Pathology of the Puerperium,"[3] writes as follows:

"Organisms can gain access to the breast through its numerous ducts when there are any abrasions on the nipple or areola, and as such breaches of surface are frequent in lactating women the entrance of pathogenic organisms readily takes place. These organisms are mostly pyogenic, and thus it is not to be wondered at that the least abrasion of the nipple becomes a septic wound. Healthy mother's milk does not come from the breast absolutely sterile. Staphylococcus pyogenes albus and aureus are commonly found and probably find their way into the milk from without, through the milk ducts. On the other hand, organisms may reach the milk through the blood in women suffering from septic diseases."

If organisms can reach the milk through the blood it is much more likely that toxins should reach it by the same channel.

In Cases 1, 2, 19, and 20 the mother's milk disappears. In many cases the disappearance of the mother's milk would point to the selective affinity of certain toxins on the secreting cells of the mammæ, thereby producing in some cases a diminution in the quantity of the milk, and in others a deficiency in the normal constituents (e.g., fats, salts, &c.) of the milk. In some 10,000 cases of infantile diarrhœa and vomiting where the children have been suckled on the breast, these cases extending over a period of nearly 10 years, the child has been immediately taken off the breast and artificially fed, and in the great majority of cases the diarrhœa or vomiting has ceased. These cases have been treated by different resident and also non-resident medical officers on my urgent representations, and in many cases the mother's mouth has been treated, and the child again fed on the breast with gratifying result. The same treatment has been carried out in numerous cases of wasting children with marked good results, proving beyond doubt that the toxic effect of the mother's milk was due to oral sepsis.

Dr. J. Lamond Lackie writes in his article on "The Physiology of Pregnancy"[4]:—

"Pregnancy creates important changes in the different systems and organs of the body. The blood and the nervous system are affected to the greatest extent, but practically all the functions of the body are more or less modified. Since the pregnant woman has to perform nutritive and excretory functions for herself and her fœtus extensive changes in the general system must occur. So long as these changes take place within certain limits, health is preserved and improved, but when carried to excess they lead to serious complications. Much has been written on the subject of the toxæmia of pregnancy. It is now believed by some authorities that many of the hitherto supposed physiological symptoms of pregnancy are the results of slight toxæmia, and that the graver complications of pregnancy, labour, and the puerperium are due to intense toxic infection. Vomiting, pigmentary changes in the skin, neuralgia, irritability of temper, &c., have generally been supposed to be normal, since they are so common, but possibly they are due to the presence of toxins. As pregnancy advances the general economy becomes adapted to the new conditions and the symptoms of poisoning pass off. The emunctory organs work at high pressure, but if one of them gives way, then symptoms of toxæmia become intensified, and may become so serious as to endanger the patient's life. Eclampsia is the most striking example of severe toxic infection. It is no longer regarded as a disease primarily of the kidneys. The causes of these toxic conditions during pregnancy, labour, and the puerperium are varied, and include heredity, climate, previous renal disease, dyspepsia, hepatic disorders, anæmia, and tight lacing. Early recognition of toxic symptoms is important, as active treatment is frequently necessary to prevent serious complications."

Now, looking at these conditions of toxæmia, two of which at least are known to be influenced by oral sepsis—viz., dyspepsia and anæmia—it does seem rational that any toxic state in the mother, other than metabolic, might be the factor that would induce one or other of these toxæmias of pregnancy and act as the proverbial straw that breaks the camel's back, and when no other toxic focus can be ascertained, and a septic condition of the mouth is present, it is logical to assume that that sepsis may make all the difference between a normal and a pathological pregnancy.

The conclusions drawn from a series of some 500 cases, from which the above 20 cases are a fair selection, are:—

1. The toxins from the maternal oral sepsis have a very strong influence in a large number of cases upon the vitality of the rapidly growing fœtus, so that the child is handicapped from before birth with a lowered vitality, and therefore the marasmic condition is ante-natal in its inception.

[3] Green's Encyclopædia of Medicine.

[4] Ibid.

2. That prematurity of birth and miscarriages, where no other cause can be discovered, are brought about by the toxic state of the mother induced by the septic condition of her mouth.

3. The diminution in the quantity, or alteration in the quality, of the mother's milk, where no other cause can be ascertained, is due to the selective affinity of certain toxins for certain secretory cells of the mammæ, and where no such diminution or alteration can be demonstrated, then the toxins, and in some cases micro-organisms themselves, are in the milk.

4. In the toxæmias of pregnancy and the puerperium the high pressure at which the emunctory organs are working is probably adversely influenced by the toxic state produced by the mouth, and this is the deciding factor in many cases that just brings the balance down on the wrong side and results in eclampsia or the other toxæmic conditions.

I would like to take this opportunity of thanking all those who have been good enough to help me in my investigations, especially Dr. R. S. Frew, for referring numerous cases, and also Dr. Gordon Moore and Dr. Eisdell Moore for their interest in the subject, and also for their care in the treatment of cases. Sister Berkeley, for the trouble she displayed in getting the mothers of in-patients to come to see me, is especially thanked. Dr. Harold K. Waller, whilst resident medical officer at the East London Hospital for Children, also referred some cases to me for investigation.

If the interest of the medical world can be aroused to take some notice of the important rôle which oral sepsis plays in pregnant women, this article will not have been written in vain; and a plea is here made for the systematic examination and treatment of the mouths of expectant mothers, as marasmus in children should be treated whilst the child is still in utero, paradoxical as this may sound; also many pregnancies will result in a normal instead of a pathological termination or complication by such treatment.

It is interesting to observe that in two cases where the mother had had marasmic children immediately before the last-born child, after the mother's mouth had been treated the next pregnancy resulted in a healthy child and no marasmus has supervened.

Cockspur-street, S.W.

THE VAGINAL PLUG.[1]

BY E. HASTINGS TWEEDY, F.R.C.P. IREL.,
ACTING MASTER, ROTUNDA HOSPITAL, DUBLIN.

THE treatment of ante-partum hæmorrhage by means of a vaginal plug is one of the oldest devices of surgery, yet it is within recent years only that the method of applying the plug has been properly understood. I remember hearing, when a student, my lecturer on obstetrics assert that he knew of no more efficient material for plugging than his silk pocket-handkerchief, and to illustrate his contention he took from his pocket an enormous scarf, dull red in colour and stained deeply by snuff and nasal secretion. I remember also an elderly doctor asserting that the family bath sponge made a most efficient vaginal plug. In my early professional days it was considered dangerous to introduce several small plugs lest some of them should be subsequently left in the vagina. It was to guard against this danger that the ridiculous kite-tailed arrangement was devised.

The subject of vaginal plugging was, however, seriously discussed only by the antiquated obstetrician, for the then modern one considered the method to be the most unsuccessful of futile manœuvres. At the present time one can hardly appreciate how great was the moral courage that enabled Sir William Smyly to become its advocate, and how keen and resentful was the opposition that his advocacy of it induced. The controversy has long since been forgotten, and statistics have proved that in its efficiency the plug has at present no rival.

The method as now practised depends for its efficiency on the capacity of the plug to push the lateral fornices of the vagina far up into the abdomen, so that they can be felt by abdominal palpation as hard rounded tumours situate well above the level of Poupart's ligaments. To plug efficiently the left hand should be passed into the vagina with the palmar surface directed towards the hollow of the sacrum, while the tips of the fingers lie behind the cervix. Small pieces of cotton-wool, squeezed out of lysol solution and each the size of the thumb knuckle, are then taken and inserted by means of the right hand round the cervix. The fingers of the left hand are kept busy squeezing the pellets into a compact mass and forcing the spaces between them to permit the insertion of still another plug. This process is continued in a systematic manner from above downwards till the vulva is reached and the vagina can hold no more. A T-bandage is applied to keep the plug in position, and an abdominal binder is fastened tightly from above downwards to press the side walls of the uterus against the vaginal dam, and thus completes the operation. A plug so applied will cause immediate cessation of hæmorrhage, and when it is removed after the lapse of hours so much blood only will be found as can be accounted for by the flow that took place during the operation.

Various explanations have been given of how the plug acts, and many of these by their ineptitude have greatly prejudiced the method of treatment. Many suppose that a back pressure on the blood-vessels is caused by the outpoured blood above the plug. This explanation is quite inadequate, and justifies Berkeley and Bonney in writing that "on first consideration the logic of plugging the vagina to arrest bleeding that is going on some distance above it may not appear obvious, yet its efficacy in cases with free external hæmorrhage is proven." These writers satisfy themselves that the efficacy of the plug depends on it increasing the power of the uterus to contract. When dealing with concealed accidental hæmorrhage, however, with the accompanying uterine inertia, they are driven to express a doubt whether the plug can have any directly useful effect. They say "it is easy to apply" and that it "has this great advantage, that it avoids rapid emptying of the uterus, a proceeding which always impresses severe shock on these patients. We think there can be no doubt that in some of these cases the bleeding has stopped by the time the practitioner comes on the scene, and that in such plugging the vagina has the great advantage of compelling him to pursue a course of masterly inactivity."

No doubt a plug applied in the method recommended by these writers will produce very different results from one applied in the way described above. They apply the plug with the aid of a speculum and a forceps, and use for this purpose rolls of cotton, each tied round with a string to facilitate removal. I feel sure it would not be possible to place in position one dozen of such rolls as are portrayed in their illustration. The plug, as I understand it, should consist of from 20 to 40 separate pieces, packed and dovetailed so closely into each other that they could not possibly be removed by pulling on them with a string.

I have quoted from the work of these writers to show how much, even now, the correct action of this device is misunderstood, and how much the method of treatment has suffered in consequence.

In 1898 I laid before this section of the Academy evidence to show that the plug acted directly as a compressor of the uterine vessels. Recently I have re-read that article and still cannot understand how anyone who took the trouble to weigh carefully the evidence I then adduced could have any doubt as to the truth of my contention. In the report of the discussion on that paper I find that, with the exception of Dr. Doyle, a general practitioner, all the speakers either ignored the suggestion altogether or treated it with contempt. It is therefore not surprising that the suggestion has not received general recognition in other countries. If truth could be destroyed by means of a studied boycott, assuredly this one would have shared that fate.

After nearly 20 years I am able now to bring forward positive proof that the plug acts in the way I have suggested. During the performance of several Cæsarean sections, after the delivery of the child and the stitching of the uterine wound, I have got an assistant to pass his hand into the vagina and to press it into the lateral fornix. In each instance his hand has formed a prominent convex tumour, which can be seen from the abdominal wound to press the base of the broad ligament upwards above the level of Poupart's ligament. On this tumour the uterine vessels lie, and I have been able to demonstrate to my colleagues, Sir William Smyly, Dr. Purefoy, and my Assistant Masters, that

[1] A paper read before the Obstetrical Section of the Royal Academy of Medicine in Ireland on April 20th.

the pulsation in these vessels is stopped by the pressure. On the last occasion I asked my assistant to tell the class what he felt. First he said the pulsation in the artery had ceased, and when I pressed the fundus of the uterus downwards to reproduce the conditions induced by the abdominal binder he said his finger had become nipped between the resistance below and the side wall of the uterus. If we remember the size and importance of the blood-vessels, both ovarian and uterine, which are situate in this region, the result of direct pressure exercised on them by a tightly fitting vaginal plug will at once become apparent.

In labour the opening of the internal os removes from the lateral fornices the support that it formerly afforded, and so allows the fornices to be pushed far up into the abdomen. In the non-pregnant state this cannot be done on account of the tightness of Mackenrodt's ligaments. These ligaments are really the tendons of the uterus. They are under the control of the uterine muscle fibres. It is the uterus by its inherent power, acting through these so-called ligaments and its other tendons, that forms the true floor of the pelvis. This is another truth of vital interest to the gynæcologist which I trust will not in its turn lie dormant for 20 years.

The vaginal plug is not easy to apply, nor is its application harmless. Sometimes, in spite of our best efforts, we cannot at the first attempt insert sufficient material to stop the bleeding. In such a case the plug must be removed entirely and then reinserted. On the second attempt the procedure will be found to have become much more easy on account of the dilatation of the vagina. Pain, distress, and some shock always follow from the application of the plug, and superficial tearing of the mucous membrane of the vagina is almost certain to occur.

It is clear that the words "vaginal plug" mean, in Dublin, something different from what they do elsewhere, and when one criticises the method of treatment one must bear the true meaning in mind.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF PLACENTA PRÆVIA AND TWINS.

BY W. GRAHAM REYNOLDS, M.R.C.S. ENG., L.R.C.P.LOND.;
AND
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OWING to its exceptional character, the following case may be worth recording.

The patient, a Chinese woman, aged 30, multipara, was sent into hospital with a history of there having been several severe gushes of blood. There had been no labour-pains, so that it was not possible to say when labour had started. Two previous confinements had terminated naturally. The patient was a strong healthy woman, of the farmer class. On examination the pulse was found to be strong and normal. The head was presenting; no fœtal heart was heard. Per vaginam the placenta was found to be centrally placed and the head presenting. The question of Cæsarean section was discussed and decided against, as the child was thought to be dead, and also we could not be sure as to who had examined previously. The os admitting two fingers and the cervix being soft and easily dilatable, it was thought that version and rapid delivery would offer the best chance for the mother, as, if there was any difficulty in delivery, perforation and extraction could be performed. Two fingers were accordingly introduced and bipolar version attempted; great difficulty, however, was experienced in turning the child. The cervix proving very easily dilatable, it was stretched with the fingers, the hole through the placenta enlarged, and a hand introduced, and first one and then the other leg was brought down. Quite gentle jaw traction was sufficient to deliver the after-coming head. The hand was reintroduced and the placenta removed. It was noticed, per abdomen, that after the child was born there was still a mass seemingly occupying the uterus. The hand introduced to peel off the placenta discovered a second fœtus, also with the head presenting. A leg was brought down and the fœtus delivered; there was a separate placenta, normally placed, which was delivered manually. The uterus contracted well, and the patient was returned to bed in good condition, not having lost much blood. The first child, though in a state of "white asphyxia," breathed well after some 15 minutes' artificial respiration had been done; the second child was quite dead, and had been so probably for a day or two. Both were males. The mother had a normal puerperium, and left the hospital with her child on the tenth day.

The chief points of interest in this case are the biocular twins, one placenta being normally placed and the other centrally over the internal os, and the ease with which the os dilated from the size of a florin to a size sufficient to admit of the passage of the first child. There was no tear either in the cervix or the vagina.

Canton, China.

CASE OF TETANUS TREATED BY INTRAMUSCULAR INJECTIONS OF ANTITOXIN.

BY G. H. V. APPLEBY, M.D., B.HY. DURH.,
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IN view of the recent discussion of the methods of treatment of tetanus by antitoxin the following case may be of interest. The notes were taken by Mr. S. A. Faulkner, house surgeon, Chalmers Hospital, Edinburgh, and lately house surgeon, Harrogate Infirmary.

Patient was admitted to Harrogate Infirmary on Nov. 14th, 1916, suffering from a deep and jagged wound, 5 inches long, of the hypothenar eminence of left hand caused by a hay-chopper. The wound was dressed and the patient retained in hospital. No prophylactic injection of antitoxin. As wound was far from clean continuous eusol baths were ordered. On Nov. 23rd, ten days after admission, twitching of left leg with tonic contractions of both recti and slight opisthotonos. Patient was at once given antitoxin serum U.S.A., intramuscularly, 1500 units, and 20 c.c. of 10 per cent. sol. of mag. sulph. subcutaneously; these were continued during next five days. On Nov. 24th the symptoms were more pronounced; profuse sweating; risus sardonicus well marked and difficulty in swallowing. Temperature subnormal; it had been so after second day of admission and did not rise with onset of tetanic symptoms. Pulse remained about 80; respirations 24. On Nov. 28th temperature rose to 100° F.; pulse 100; respirations 28 and very laboured. Abdominal muscles contracted like a board. Patient was unable to swallow; clonic contractions of muscles of both legs and arms. Chloral hydrate was given per rectum, and antitoxin increased to 8000 units daily for three successive days (Nov. 28th, 29th, 30th). On Nov. 30th marked signs of improvement. Temperature normal; pulse 80; respirations 24 and less laboured. He could swallow, though with difficulty. Antitoxin again reduced to 1500 units, and continued daily together with injection of mag. sulph. until Dec. 20th. Patient continued to do well, the spasmodic contractions gradually abated, though the recti and abdominal muscles remained obstinately contracted well into convalescence and after the wound was soundly healed. He was discharged well on Jan. 3rd, 1917.

There is little doubt that in this case the initial doses of the antitoxin were too small, and that the very much increased doses had a quick and marked effect. Another point noticed was the persistence of the contraction of the abdominal muscles.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.—The annual general meeting of this society was held on May 18th, at 11, Chandos-street, W., Sir Alfred Pearce Gould, the President, being in the chair. From the annual report it appears that the invested capital of the society amounts to £140,000, and £4223 13*s.* 11*d.* were distributed during the year amongst the 48 widows and 9 orphans who are in receipt of grants. The working expenses amounted to about 4½ per cent. of the income, practically the whole of the income of the society being spent on the grants; but although nearly 7000 medical men are eligible for membership of the society, as residing within a 20-mile radius of Charing Cross, barely 300 are members. The President, commenting on this fact, said he quite realised that the young medical man just qualified thought he could never fail to rise to the top of his profession, but it only needed to attend the meetings of the court of directors to realise that in many instances these hopes were not attained.

Reviews and Notices of Books.

Medical Bacteriology. For Practitioners and Students. Edited by Dr. L. A. TARASSEVITCH. In three parts of 428, 700, and 200 pages respectively and an Atlas of Microphotographs in 16 plates. Petrograd and Kieff. 1912–1915. Price 17*s.* 8*d.*—This is a large text-book on bacteriology in Russian, to which 36 writers have contributed, including the preface by Professor Metchnikoff, the whole being under the editorship of Dr. Tarassevitch, of Moscow. Apart from the monumental work of Kolle and Wassermann, no other bacteriological treatise reaches the dimensions of Dr. Tarassevitch's work, which is original throughout. Each part is written by a specialist, and includes the best known Russian bacteriologists, such as Omelianskij, Tchistovitch, Wladimiroff, Zabolotny, and Korschun. Among the younger generation appear the names of Yakimoff, Klimenko, and Padlewsky. From the Pasteur Institute in Paris the Russian workers Besredka, Weinberg, Shoukevitch, and Romanovitch are important contributors. The life-history of all the pathogenic organisms is fully and critically described, and at the end of each chapter there is a general survey of the pathological lesions produced. Immunity reactions are exhaustively dealt with, the most recent phenomena in this involved field being adequately treated. Although some of the authors show a tendency to dogmatise a little more than is justifiable, it will be found in general that the work is excellently done. The supplement contains a special chapter on the infective diseases of plants and epizootics. It has been the aim of Dr. Tarassevitch to make the work exhaustive and at the same time practical, and he has succeeded in bringing out an eminently satisfactory text-book. Most encyclopædic works suffer from the defect that the various authors do not adopt the same methods of treating their respective subjects. In Tarassevitch's "Medical Bacteriology," however, a singular uniformity has been preserved. Although many Russian investigators have made great names for themselves during the bacteriological epoch in medicine this work in its completeness and magnitude will come rather as a surprise to a generation who has believed that it is only the German works that count, and it shows the high standard of medical intellectual culture in a country which has been to a large extent neglected in Western Europe. Accustomed to the high price of English medical books, the price of Dr. Tarassevitch's treatise must appear remarkable.

Les Fractures de l'Orbite par Projectiles de Guerre. By FELIX LAGRANGE, Professor in the Faculty of Medicine, Bordeaux. With 77 figures in the text and 6 plates. Paris: Masson et Cie. 1917. Pp. 222. Price 4 francs.—Professor Lagrange has written a very valuable précis of the war injuries to the eye under the misleading title, "Fractures of the Orbit." Many of his observations, which are founded upon an extensive experience at an important base hospital, are original, are discussed with a thorough knowledge of the pathology of the eye, and demand full recognition from ophthalmic surgeons. They are likely to overlook the importance of this small book, so inadequately described in the title, and it is therefore the more important to draw attention to the outstanding features of its contents.

Successive chapters deal with the surgical anatomy of the orbit, general considerations on the etiology of fractures of the orbit, fractures of the orbit with conservation of the eyeball, fractures of the orbit with destruction of the eyeball, treatment of orbital fractures, treatment of ocular complications, and reparative surgery. Many of the injuries of war, of course, resemble those met with in civil life, are due to similar causes, and require similar treatment. These are adequately discussed, with the citation of many illustrative cases, by Professor Lagrange. Of greater value are the original observations, the accuracy of which will for the most part be confirmed by the experience of British ophthalmologists. Thus it is pointed out that the direct injuries of war do not cause fractures of the roof of the orbit and implicate the optic foramen or sphenoidal fissure by irradiation, as is so commonly the case in fractures of the base of the skull in civilian life. The latter are generally caused by falls upon the head or severe blows directed downwards upon the vertex of the skull, injuries rarely met with in war. When the eye is directly struck by a projectile it is generally hopelessly disorganised. Slighter injuries are due either to the penetration of minute metallic fragments or to concussion. A projectile passing in the immediate vicinity of the eye causes severe injuries by concussion. Most of the ordinary effects of concussion, such as iridodialysis, traumatic cataract, dislocation of the lens, and so on, are frequently seen. Professor Lagrange has never seen an ordinary rupture of the globe in the intercalary region. We can confirm this observation, but possibly such cases do occur and the eyes are excised before the patients reach the base hospitals. Lagrange has seen many detachments of the retina, which does not altogether accord with our experience. He is certainly right in his remarks on the frequency of ruptures involving both retina and choroid. These are rare in civil life, whilst choroidal ruptures are common. Retino-choroidal ruptures are followed by the development of masses of cicatricial tissue in the fundus which are very familiar to those who have seen many war injuries of the eye. The repair of cicatrised and distorted sockets and of the ghastly ravages produced by war wounds of the face is one of the most trying tasks of the surgeons at the base. Professor Lagrange writes very enthusiastically of the value of fatty and cartilaginous grafts, especially of the latter. The book is admirably illustrated by very clear diagrams and excellent half-tone blocks of fundus conditions.

JOURNALS.

The Indian Journal of Medical Research. Vol. IV., No. 3.—This is a specially good number, and it is notable, moreover, for the beauty and excellence of its many coloured plates. It contains an abstract of the address delivered by Surgeon-General Sir Pardey Lukis before the Indian Section of the Royal Society of Arts, on the opportunities for medical research in India. Dr. R. Row, of the Petit Laboratory, Byculla, Bombay, describes a simplified technique devised by him of Bass's method of cultivating malarial parasites *in vitro*, along with some observations on the malarial parasites cultured by this technique. This paper is illustrated by seven coloured plates and numerous charts. A note on flagellate dysentery is contributed by Dr. S. C. Chatterjee, assistant professor of pathology at the Medical College, Calcutta (with five coloured plates). Captain H. E. Shortt furnishes notes on two hæmogregarines of cold-blooded vertebrates, illustrated by two coloured plates. The next two papers are by Major Clayton Lane in continuation of his previous work on intestinal parasites, the first relating to *Bunostomum kashinathi* and the Ankylostomidæ (with four plates); the second, a short paper, is entitled "Are *Echinostomum malayanum* and *Artyfechinostomum sufrartyfex* Identical?" The report of a special investigation conducted under the auspices of the Indian Research Fund Association, on dysentery in the jails of Eastern Bengal, is supplied jointly by Major J. Cunningham and Captain H. H. King. This contribution extends to 56 pages and is illustrated by photographs, maps, and charts. A study of entamœbic cysts is contributed by Captain R. Knowles, I.M.S., of the Bombay Bacteriological Laboratory, in conjunction with Captain A. F. Cole, R.A.M.C., of Cumbala War Hospital, Bombay. This paper is illustrated by four coloured plates and a number of charts and tables. Two editorials complete the number, the first dealing with a new species of Anopheline, *Myzorhynchus similis*, sent from the Malay Peninsula by Mr. Richardson, travelling entomologist, the second being a summary of current medical research in Germany, compiled from various German periodicals for the benefit of those workers in India who have a difficulty in obtaining current German literature in war time. This summary, among other things, deals with typhus, cholera, influenza, pyrexia of unknown origin, &c.

Revue de Chimiothérapie et de Médecine Générale. 1e ann. No. 1, Jan.-Févr., 1917. Rédaction: 2 rue de Rivoli, Paris.—We are asked by Dr. J. Laumonier, rédacteur-en-chef, to announce the issue of this review of chimiotherapy, a new science, we are told, "which Germans had accaparated for their own benefit," notwithstanding that two French physicians, Dr. Dujardin-Beaumetz and Dr. Bardet, had been, about 20 years ago, its true inventors. The number contains three abstracts from American journals, an article by Dr. Henri Bouquet on the present position of antitetanic sero-therapy, a review of the chimiotherapy of tuberculosis signed J. M., and chiefly dealing with cyanocuprol, and an original article by the editor on colloidal iodine furnished by Messrs. E. Viel and Co.

THE LANCET.

LONDON: SATURDAY, JUNE 2, 1917.

Heliotherapy.

FOR many years the Continental medical press has contained more or less scientific contributions on the subject of heliotherapy, and only the overpowering importance of all subjects connected with the war has preserved sun-treatment from the unbalanced puffs of the amateur physician in the lay press at home and abroad. But in the case of sun-treatment publicity has distinct advantages. Scientific heliotherapy is still in its infancy, and even the physicians best qualified to give an opinion admit that they are, so to speak, groping in the light, and that the element of empiricism in their procedure is still very great. Two recent discussions in Christiania and Gothenburg have clearly shown how insecure the scientific basis of heliotherapy still is. Some speakers in Christiania characterised the heliotherapy practised in certain quarters as but little more than a well-advertised business undertaking, and suggested that the flood of "before" and "after" illustrations was over-flowing and calculated to give the misleading impression that heliotherapy is a panacea. Other speakers joined issue over the physics of heliotherapy, and the opinions expressed as to the comparative value of sunlight and the various artificial lights were also conflicting. Nor need we be surprised at this, for even on small practical points in sun-treatment there are quite divergent views. Some authorities, for example, regard rapid bronzing of the skin as highly desirable and beneficial, while others see in excessive pigmentation a screen, depriving the body of some of the most valuable constituents of sunlight. Nothing but exhaustive observation can decide where truth lies.

But though stress on our ignorance of the processes occurring in the body as the results of insolation must be confessed, as well as the elementary character of heliotherapy as practised to-day, it would be unjust to ignore the recent pioneer work in this field by Dr. A. ROLLIER and others. ROLLIER, in particular, has earned our gratitude by elaborating a well-regulated system, by insisting on accuracy of dosage, by directing attention to idiosyncrasy of the individual, and by emphasising the dangers of indiscriminate practices. A perusal of his well-known and beautifully illustrated text-book, "Cure de Soleil," will convince the reader of the care with which ROLLIER hedges in his procedure. But the average patient no more dreams of taking his sun-baths according to medical prescription than of regulating his breakfast by other dictates than those of common-sense. Physicians at seaside resorts are familiar with the consequences of sun-bath orgies, for "beach fever" is no rare complaint in the holiday months. At the present stage it is urgently necessary that the dangers of heliotherapy should be recognised and preached; the antics of the crank are calculated to damn this valuable remedy more effectively than the most stodgy indifference. He is to be found by the score in every bathing resort, exposing to the sun by the hour his head and neck—the parts of the body most vulnerable to sunlight. Or, emerging from the shades of a London office, he starts his course of "heliotherapy" with several hours' exposure of most of his body. Little wonder if he returns to work a few weeks later listless and irritable, with a blistered skin and an aching brow. Some years ago a German writer called attention to the ill-effects of self-administered heliotherapy in an article in which he drew a well-defined clinical picture of nervous exhaustion and irritability. Many of our readers may be consulted concerning sun-treatment in the course of the next few weeks, in which case they will be well advised to recall the existence of quite serious conditions that may be induced by injudicious exposure to the rays of the sun.

The Swiss mountain health resorts offer admirable facilities for heliotherapy, and encouraging reports are coming in from other countries blessed with a less prodigal wealth of sunshine. In Norway, for example, heliotherapy has been adopted as part of the sanatorium régime by Dr. HOLMBOE at Mesnalien, and his verdict in cases of pulmonary tuberculosis in every stage when submitted to heliotherapy is favourable. The euphoria following the exposures was often so great, even in cases of advanced disease, that the patient was apt to exceed the prescribed limits. HOLMBOE adopts the cautious dosage recommended by ROLLIER in surgical tuberculosis, the first exposure being of the feet and ankles only and limited to a period of five minutes. In the course of about eight exposures he works up to a maximum of 4½ to 5 hours a day, the whole body, except the head, being treated. In this country heliotherapy has hitherto been at a discount. Yet it is not such a fog-bound island as the continental tradition would have it, and many a golden opportunity for turning the sun to account is undoubtedly lost. The institutions in which a properly planned solarium exists are, indeed, few; but it is to be hoped that when we emerge from this war heliotherapy will be introduced into the routine of sanatorium treatment. Already Mr. H. J. GAUVAIN[1] has shown at Alton that heliotherapy is a practical proposition in this country, and it is satisfactory to note that he is not blindly practising heliotherapy by rule of thumb, but is evolving and testing theories which may help to place this treatment on a more rational basis.

Medicinal Plants.

SERIOUS dislocation of important industries must always be reckoned among the inevitable results of hostilities in any part of the world, and it is only natural that efforts should be made to counterbalance and reduce the inconvenience at the earliest moment. While in this country the most pressing trouble lies in problems connected with

[1] THE LANCET, 1917, i., 663.

food-supply, the work of many surgeons, physicians, and pharmacists has been hampered by the war. Surgeons have found difficulty in replacing instruments, while physicians and pharmacists have similarly had trouble in making good the shortage of many synthetic remedies formerly derived from Germany. In addition there has been considerable inconvenience in pharmacy owing to the divergence into more important channels—munitions—of many articles previously largely employed in medicine. Therefore the supply of medicinal plants is attracting a great deal of attention at the present time, and we publish this week a note by a practical grower on their cultivation. The matter also formed the subject of a recent lecture at the Royal Society of Arts by Mr. J. C. SHENSTONE, F.L.S., and in the course of his remarks he emphasised the need of careful and continuous attention to scientific culture and economic organisation if herb-growing was to be of any real service to anybody. He admitted that much of the work would be of an experimental nature, to determine whether, under cultivation, the amount of active principle could be increased, though the value of home-grown medicinal plants might be much appreciated by war conditions.

To adapt ourselves to war conditions forms a part of the necessary process by which we all have to learn to share in helping to win the war. Manufacturing chemists have thus been stimulated to produce the equivalent of many synthetic remedies which were formerly imported, and it is to be hoped that in post-war conditions these new compounds will hold their ground against the inevitable foreign competition. The production of synthetic remedies must always remain in the hands of skilled pharmaceutical chemists, and it affords no outlet for the well-meaning efforts of the amateur. But the growing at home of medicinal plants was seen at once to give him a possible chance. Indeed, a promising field of energy was found in the attempt to popularise the collection and the cultivation of plants to be used as medicines. But the most earnest advocates of this movement admit regretfully that the number of indigenous plants officially recognised in this country is remarkably small, though they point to the plants used in France and in the United States as indicating that our employment of herbal remedies is unduly restricted, seeming to hope that an increased or varied supply of remedies will create a demand. Meanwhile it is realised that there are certain dangers in leaving the task of collecting in the hands of the untrained, and with a view to indicating where these dangers lie a charming little book on "Herbs Used in Medicine," with excellent coloured plates, has been published by the National Herb-Growing Association. Even in this small volume several plants which are not official are depicted, and the reader is referred to the two volumes, printed in 1790, of Dr. WOODVILLE'S "Medical Botany," with plates of all the medicinal plants then official. He will then see that it is possible that our whole outlook on the subject has been too narrow.

Undoubtedly very many vegetable drugs have been discarded since 1790. Remembering this, but knowing also that it has been prudence and not prejudice which has dictated the scientific attitude, we fear that an attempt to revive interest in home-grown pharmaceutical plants is doomed largely to disappointment. They have been tried and found wanting. Modern tendencies amongst medical men point to a form of treatment based upon an intimate knowledge of pharmacology, and the vegetable drugs which are retained in most instances have had to justify their existence as remedies by the presence of some definite alkaloid or active principle. If the activities of the National Herb-Growing Association are limited to the encouragement of an increased supply of herbs possessing alkaloids or active principles it is possible that a glut in the market may be produced speedily. On the other hand, it is very probable that, owing to improper methods of cultivation, a large amount of trouble will be expended without any corresponding advantage, as it is well known that medicinal plants require many peculiar conditions of soil and climate before they can attain the standard required by authority. With adequate care and knowledge these difficulties may be overcome, but the conditions cannot be met by enthusiasm alone. They demand special training and considerable expenditure, facts which were recognised by Mr. SHENSTONE in his lecture, in which he pleads for a Government Department entrusted with funds. We would not for a moment be found damping down the fires of a well-intentioned energy, but the article from a practical grower, to which we have already referred, reinforces Mr. SHENSTONE'S lesson that both money and expert knowledge are called for if the result of the growing of medicinal plants in this country is to be relative to the labour put forth.

Annotations.

"Ne quid nimis."

ATMOSPHERIC POLLUTION: A SENSIBLE GOVERNMENT GRANT.

THE Committee for the Investigation of Atmospheric Pollution has been constituted an "Advisory Committee on Atmospheric Pollution" to the Meteorological Office, and the advantages likely to result from obtaining a continuous record from year to year of the state of the atmosphere as regards suspended impurity have been recognised by a Government grant of £500, allotted by the Department of Scientific and Industrial Research, and designed to cover the cost of the work of the committee for the current year. The grant is intended to defray the expenditure of the Advisory Committee only, and was given on the understanding that the cost of gauges, collection, and analyses should be borne by the authorities which coöperate by setting up observing stations. Provision has been made for the nomination by each coöperating authority of a person for appointment as a member of the Advisory Committee. The action of the Department of Scientific and Industrial Research in making the grant was

only taken after full and careful consideration of the public advantages likely to accrue from the continuation of the work even during the war. At the same time, and since the value of the investigation depends on there being a sufficient number of observing stations, it was indicated that every effort should be made to maintain existing stations and to increase the scope of the movement, which has throughout received all the assistance which this journal could afford it. The collection, compilation, and publication of exact statistics on the suspended impurities of the air has a valuable function and supplements the study of all problems relating to fuel economy and smoke prevention. The reports for the years 1915–16 and 1916–17, forming the second and third annual reports of the committee, will shortly be published. Full information as to method of working at observation stations, with standardised instructions and blank forms for returns, can be obtained from the honorary secretary of the society, Dr. J. S. Owens, 47, Victoria-street, London, S.W. Since November, 1914, the returns in the form of a table, under the heading of "A Monthly Record of Atmospheric Pollution," have regularly appeared in our columns (those for the months of October and November, 1916, appear this week), and reprints are distributed to the committee and workers.

HYPOTHERMY AS AN EPILEPTIC EQUIVALENT.

IN the *Paris Médical* for May 12th, 1917, Dr. P. Carnot and Dr. A. de Kerdrel record a curious case coming under their observation at one of the neurological centres organised by the medical staff of the French Army.

The patient was a sergeant of the Chasseurs Alpins, aged 24, who was wounded on Sept. 16th, 1915, by a bullet which struck his forehead above the left eyebrow. Two hours later he was trephined. He is said to have remained unconscious for some 15 days, and on recovering his senses he found he was completely paralysed on the right side, but was able to speak. In the course of a month or more the hemiplegia gradually disappeared. Seven months after the date of the injury the patient suddenly had a fit of Jacksonian epilepsy, beginning in the right arm and becoming generalised; its duration was a quarter of an hour. Twenty-seven days later he had a second attack, beginning in the fingers of the right hand, and following the usual march up the arm and down the trunk and right leg. When he came under the observation of the writers he was seen to have a pulsating depression two finger-breadths above the outer end of the left eyebrow, pressure on which, however slight, produced an unpleasant feeling of malaise and painful radiating sensations referred to the right arm. There was slight general weakness of the right arm and slight diminution in sensibility in the same distribution. The rectal temperature was normal. A few days later a remarkable lowering of the temperature took place in a progressive fashion: from 36·7° C. (98° F.) it went gradually down in the course of three days to 34·4° C. (94° F.), rising again almost to normal in some 24 hours. Two days later another Jacksonian fit occurred of the same typical kind as before. On this occasion, however, repeated slight attacks also took place involving the right arm only, followed by paresis of the arm. On this occasion, further, the contractions in the arm were very painful, a condition which had not been remarked before. Some five or six days later the temperature began to fall again, and went down to 34·2° C. (93·5° F.), again gradually rising in the course of two or three days; a brief attack occurred at that time, influenced, no doubt, by the bromide treatment which had been instituted. This treatment also was responsible for the curtailing of a third phase of hypothermy and painful tingling in the right arm, without twitching, which developed some 14 days later. On the suggestion of Professor Sicard, in charge of the neurological centre, the patient's wound was reopened and the cicatrix was found to be adherent to the underlying gyri. It was completely freed, and thereafter the attacks of Jacksonian epilepsy and the hypothermy both ceased.

The question of heat "centres" in the nervous system is still the subject of much discussion among physiologists. Clinical evidence is abundant but conflicting. Cerebral lesions not infrequently produce a state of marked thermic disequilibrium. Sir William Gowers recorded a case of thrombosis of the basilar where the temperature rose to over 109° F., repeatedly verified. On the other hand, Janssen has reported a temperature of 87·2° F. in a case of general paralysis. Further, remarkable changes in body temperature occur after traumatic lesions of the spinal cord, and these vary with the level of the lesion, as has been shown by Gardiner and Pembrey in a series taken from the Guy's Hospital reports over a period of 50 years. There is, also, some evidence to suggest that in epilepsy an "attack" of hypothermy or hyperthermy may be of the nature of an epileptic discharge—an epileptic equivalent. In the present case the association between the two is curiously significant. The interpretation of these and other thermic phenomena may be difficult, but the subject is one deserving further study and investigation.

BACK TO THE LAND AND THE WAGES QUESTION.

THE National Housing and Town Planning Council has issued, in the form of a letter addressed to individual Members of Parliament, a pronouncement of its views upon the subject of the weekly wage contemplated for the agricultural labourer by the Corn Production Bill. Its main proposition is that the suggested minimum wage of 25*s.* is inadequate, and does not represent for the labourer an advantage corresponding to that offered to the farmer with the object of increasing the country's production of food. The Council does not put forward an amount to be substituted, but suggests that even the 30*s.* per week asked for by the National Agricultural Labourers' Union will prove insufficient. This opens up a serious prospect for those responsible for the national finances after the war, and for the promotion of agriculture under conditions to be brought about by statute, but as 25*s.* constitutes a rise of over 100 per cent. for the labourer in two counties, according to the statistics relied upon by the National Housing and Town Planning Council, and as in few areas will an increase of less than 100 per cent. be represented by a weekly wage of 30*s.*, it is clear that drastic reform is called for. The sums given as the "total earnings" of the labourer before the war, amounts which presumably include harvest money and like bonuses, will probably have to be raised by increasing these extra payments upon a scale corresponding with the increase in wages, for it can hardly be expected that they will be foregone, and their value as the rewards of industry will have depreciated as much as that of the weekly wage. The question of adequate agricultural wages will have to be faced and a decision arrived at, for the importance of it is evident, and the arguments put forward in the letter of the National Housing and Town Planning Council are clearly stated, whatever conclusion of assent or dissent be arrived at after perusing them. The aim of the legislator, in addition to that of providing for our future food-supply, will be to keep good workmen on the land and to tempt good workmen to return to it from the towns to which they have migrated, driven thither to a large extent by bad wages and bad housing accommodation in past generations—grave errors for which we are now about to pay. The matter of housing accommodation naturally receives prominence in the Council's letter, and from 5*s.* 8*d.* to 7*s.* 1*d.* are the weekly

rentals which it regards as necessary if cottages of a suitable character are not to be built at a loss to those providing them. The increased price of food and other commodities, together with the prospect of such prices being long maintained, is the other element in the calculation, and here also the National Housing and Town Planning Council presents a case deserving careful consideration by the legislature. The Council considers that the minimum wage proposed is inadequate, and that a degree of benefit is promised to the farmer which is denied to the labourer. That something short of the increase suggested by the Council's letter may be found adequate is possible, but it is of vital importance to bring the workman back to the land, to live there in healthy circumstances and to breed a stalwart race that will repair the ravages of war. To medical men, to eugenists, and indeed to all thinking persons it is inconceivable that such a policy should be defeated by the costliness of the means for attaining it.

HÆMATURIA FROM RIDING.

IN the *Medical Review* for May attention is drawn to a cause of hæmaturia which is not generally recognised—riding. This contingency is of special interest at the present time as the subjects were medical men who were learning to ride, evidently for the purpose of undertaking military work. Two cases have been recorded by different German writers. The first is reported by Grünbaum[1]:—

A medical man, aged 32 years, was given his first riding lesson on June 8th. The next day he rode for half an hour without stirrups on a rearing horse. About two hours later he noticed that his urine was scanty and of a reddish-brown colour. He also had the usual pains associated with the first riding lessons. He took a bath and about three hours later collapsed and had to go to bed. He was a perfectly healthy man, whose urine previously had been normal. Examination now showed 0·06 per cent. albumin, a few granular and hyaline casts and a few erythrocytes. On June 10th the albumin had increased to 0·1 per cent., and there were numerous granular and hyaline casts with a few erythrocytes. Next day, in addition to the constituents mentioned, leucocytes, epithelial cells, and a few epithelial and blood casts were demonstrable. On June 12th there was no longer any albumin and the number of formed elements was much reduced. On the 15th microscopic examination showed nothing abnormal. No renal symptoms, such as œdema or cardiac complications, were present, and there was no sign of any infectious or cardiac complaint. The hæmaturia was therefore regarded as due to concussion of the kidneys.

The second case is recorded by Gast,[2] who was himself the subject.

Unaccustomed to violent exercise, he took lessons in riding. The riding-master, a non-commissioned officer, at once forced the pace, making him trot without stirrups. After the first day he ached all over and on the following day did not ride for so long. On returning he noticed that the urine was very red. Innumerable red cells and a few casts and other formed elements were found. Suspecting that the hæmaturia was due to concussion, he spent the afternoon and night in bed and took a light diet. Next morning there was no macroscopic sign of blood, but under the microscope red cells were still demonstrable, as well as a few hyaline casts, but they were far less numerous than on the previous day. He did not lie up, and in the next few days all trace of albumin and blood disappeared. A few weeks later he resumed riding lessons under a more sensible master and began more cautiously. Though he continued the lessons for weeks the renal symptoms did not recur.

Gast refers to Grünbaum's case, and considers that both cases show that it is not necessary for a soldier who develops hæmaturia after the first hours of riding to give it up provided the hæmorrhage is due to concussion. These cases also show the folly of forcing the pace in a course of riding lessons, as is often done in Germany. The jolting of the whole body when stirrups are not used is so severe that unless the exercise is graduated there may be ill effects.

[1] Münch. med. Woch. [2] Deut. med. Woch.

MEDICAL RESEARCH IN INDIA.

THE valuable paper read not long ago for Surgeon-General Sir Pardey Lukis by Sir Havelock Charles before the Indian Section of the Royal Society of Arts has drawn the attention of the medical public to the great progress which has been made in our knowledge of certain diseases in India, and also to the unrivalled opportunities afforded in that country for prosecuting medical research. He pointed out some of the many benefits conferred already upon mankind, especially in respect of tropical diseases, by Indian investigations. The discovery, for instance, of the spirillum of relapsing fever by Vandyke Carter at Bombay, opened out a new vista in connexion with the origin of specific fevers. The demonstration by Ross of the proteosoma parasite in birds, and his subsequent observation of a similar cycle of development of the malaria parasite, began a new era in the history of tropical medicine. Since then the detailed work carried out in India in connexion with the plague bacillus and the special investigations made concerning the cholera vibrio form valuable additions to the general stock of knowledge, and upon them have been based many of the practical measures formulated for the control and prevention of these diseases. No less important have been the recent contributions made in India in the field of scientific therapeutics, and in this connexion the methods of treatment of cholera, dysentery, kala-azar, and leprosy, recorded by Rogers in Calcutta, are deserving of special mention—examples which do not by any means exhaust the list. In the immediate future we may anticipate fresh discoveries as a result of the new research laboratories established in Bombay, Kasauli, and Madras. Two new schools of tropical medicine are being inaugurated at Bombay and Calcutta, and when the present world-wide war is over and the various professors and lecturers return to India from their military service it may confidently be expected that, by the education of native medical men in modern scientific methods of research, a fresh stimulus will be given to the investigation of those diseases of India the nature and origin of which are still obscure. The recruiting of the Indian Medical Service from the more highly qualified and earnest young practitioners of our own country may also be expected to assist, as in the past, in elucidating many medical problems in view of the special opportunities now afforded in India to competent investigators. The establishment in 1911 of the Indian Research Fund Association, generously endowed by Government, is likely to prove of great assistance to qualified experts who otherwise, on account of the cost, would be unable to carry out their protracted experiments. The *Indian Journal of Medical Research*, which is edited by the Director-General of the Indian Medical Service and the Sanitary Commissioner with the Government of India, and published by the Indian Research Fund Association, supplies a convenient and useful medium for making known to the scientific world the results obtained by these investigators. This journal is now in the fourth year of its publication, and already many important contributions have appeared in its pages relating to such subjects as malaria, plague, cholera, yellow fever, kala-azar, ankylostomiasis, dysentery, goitre, and leprosy, as well as the bacterial standards of tropical water-supplies, the cinchona derivatives, the flies and mosquitoes

of India, parasitic ticks, and the like. Some current investigations, we learn, have been interrupted by the war, but will be resumed as soon as peace is declared. In another column we notice the last issue, which is notable for its profuse and valuable illustrations.

A CASE OF PROGERIA.

PROGERIA is defined by Mr. Hastings Gilford[1] as "primary spontaneous infantilism mingled with premature senility." The premature senility is its most obvious feature, and only a few cases of it have been described. Dr. J. C. Schippers has recently reported[2] a new instance.

The patient, a boy weighing 6 lb. at birth (August, 1911), was the first child of healthy parents. He was fed at the breast for a time, but was always puny and had a disproportionately large skull with prominent veins on it. After the first year, when he had whooping-cough, his hair fell off; his first teeth appeared and he walked at 18 months, and at the age of 2 he talked. His mental faculties seemed normal, and he got on well with other children. Dr. Schippers first saw him in April, 1915; he was a slightly built child with a very large rounded forehead, brown ill-nourished skin, projecting eyes, bald and prominently veined head, slightly enlarged thyroid, and over-large joints. The thoracic and abdominal viscera seemed normal, and no evidence of arterio-sclerosis could be obtained; there was nothing found amiss with the nervous system or the urine. Examination of the blood showed slight anæmia, and over 9 per cent. of the white cells were eosinophiles. The head was 49 cm. in circumference, the chest 48 cm., and the child weighed 25 lb. Examination with the X rays showed a normal sella turcica and nothing abnormal about the ossification of the bones generally. Eighteen months later the child was seen again and was in much the same general condition. He was over 5 years of age, but the anterior fontanelle was still open; the head was 50 cm. in circumference, the height was 88 cm., the weight over 26 lb., and an Arneth blood-count gave normal results.

Dr. Schippers mentions as the chief features of this case the pigmentation and malnutrition of the skin, the prominence of the joints, the open anterior fontanelle, and the baldness, with greyness of the few remaining hairs. Photographs, indifferently reproduced, show the build, pigmentation, and aged look of the child; his facies recall that of the well-known case recorded by Mr. Hastings Gilford. Dr. Schippers discusses the pathogenesis of progeria, which remains obscure.

THE CENTRAL STATISTICAL BUREAU.

WE referred in our issue of May 19th to the vital statistics for 1915 at some length, for it is of the greatest interest to know how the first year of war affected the population as shown by official figures. The value of statistical information is to-day increasingly recognised, and we are glad to learn that for the future the Registrar-General will undertake the responsibility of furnishing local mortality statistics to the medical officers of health of the various sanitary authorities throughout the country. In this way they will receive an adequate record of vital statistics the trustworthiness of which is guaranteed by a Government department. That this important duty should be undertaken, as a matter of routine, by the central statistical bureau has always been the contention of THE LANCET, and it is hoped that the system, which was successfully inaugurated last year, may be continued permanently, with the abolition of overlapping. Indeed, adherence to former methods of estimating populations has been rendered impossible by conditions of war. Men of military age have been largely drafted to military training centres or have been sent abroad with the Army, and the remainder of the male adult population, as well as much of the female population, has migrated to an inordinate extent into areas other than those in which it had been enumerated in 1911. In these circumstances estimates, whether of total or local populations, on the basis of Census returns, were obviously inadmissible, and the National Register of 1915 became the best available substitute. The only local estimates attempted have been those of total civil populations in the several areas, based on the results obtained from the National Register. A new light on the difficulties encountered, as the result of war, in the estimation of local populations was supplied by Sir Bernard Mallet's presidential address to the Royal Statistical Society, which has been reprinted for private circulation. In this document, the extent to which local fluctuations affect the vital statistics of administrative areas is revealed in the statement, that "owing to the unprecedented dislocation of the population caused by the withdrawal of men of military age from civil life, and the demand for munition factories and war services, the data for calculating local birth-rates and death-rates with any approach to accuracy simply do not now exist." After acknowledging appreciatively the help already derived from national registration, he goes on to assert that, without annual revision, national registration can supply no basis for calculations in this and future years. Fortunately, however, the need for some kind of enumeration for statistical purposes, at the conclusion of war, is conceded by the majority of those whose judgment is entitled to respect.

POISONING BY RHUBARB LEAVES.

AT the resumed inquiry held by the Enfield coroner on Tuesday last into the death of a local minister of religion, Dr. B. H. Spilsbury, who made the necropsy, attributed the fatal issue to coma consequent on oxalic acid poisoning, the oxalic acid having been taken in the form of cooked rhubarb leaves. Mr. J. Webster, assistant analyst to the Home Office, stated that he had found oxalic acid in certain organs of the body and no traces of any other poison. Analysis of rhubarb leaves from the same ground as those eaten by the deceased showed the presence of calcium and potassium oxalates in quantity about 10 grains of each to the pound. Dr. Spilsbury characterised this quantity as a borderline amount sufficient to cause serious symptoms in certain people. The smallest recorded fatal dose of oxalic acid is given in text-books as 60 grains, and the soluble acid potassium salt is stated to be equally poisonous. Taken in concentrated form both act as violent irritants and quickly excite vomiting, by which some at least of the poison is expelled. Well diluted or taken with other food gastric irritation may be absent and nervous symptoms dominate the case, due to alteration of the calcium content of the blood. Combined with calcium oxalic acid is entirely inert. The coroner uttered a warning against the use of soda in cooking rhubarb stalks —an addition which has been recommended to neutralise the acidity and avoid the necessity of adding sugar—inasmuch as a soluble oxalate may be produced by its action. He might well have given the positive injunction to add a pinch of powdered chalk in the cooking, whereby the same end is attained with perfect safety.

[1] THE LANCET, 1914, i., 672.
[2] Nederl. Tijdschr. v. Geneeskunde, Amsterdam, 1916, ii., 2274.

THE GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

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WEDNESDAY, MAY 23RD, AND THURSDAY, MAY 24TH.

THE Council resumed its sittings at its offices, 44, Hallam-street, W., Sir DONALD MACALISTER, the President, being in the chair.

Penal Cases.

The first case to be considered was that of Thomas Dixon Cook (adjourned from Nov. 29th, 1916[1]) on a charge of enabling certain uncertified women to attend women in childbirth in contravention of the Midwives Act, 1902.

At the conclusion of the hearing in November the President announced that the Council had found the facts alleged in the charge against the practitioner to be proved, but judgment was postponed until the present session.

Mr. Cook attended, and the complainants, the Central Midwives Board, were represented by Mr. J. Bertram, solicitor.

Mr. COOK made a brief statement in which he stated that since he appeared before the Council he had conducted his midwifery practice entirely in accord with the Council's requirements.

Testimonials from certain medical practitioners in Torquay were read stating that no fault was to be found with Mr. Cook's professional conduct since he appeared before the Council.

The PRESIDENT said: Mr. Cook, the Council having considered your assurances as to your future conduct and the testimony in your favour given by your professional brethren as to your conduct in the interval, does not see fit to direct the Registrar to erase your name from the Medical Register.

The next case was that of Edward White, registered as of 2, Green Park, Bath, L.S.A. Lond., 1893; M.R.C.S. Eng., 1900; L.R.C.P. Lond., 1900, who had been summoned to appear before the Council on a similar charge.

Mr. White attended, and the complainants, the Central Midwives Board, were represented by Mr. J. Bertram, solicitor.

Mr. BERTRAM, for the complainants, submitted three cases on which the complaint was framed. Mr. White, he stated, was not present at any of the deliveries, which were conducted by an uncertified woman, Mrs. Webb, and, as he was informed, the services rendered by the medical man of a medical kind were not very much more than perfunctory services. The engagement in all cases was not made by the patient or or behalf of the patient with the medical man, but was made by the uncertified woman, who said she would see that the doctor came.

Mr. WHITE addressed the Council on his own behalf and stated that he had no intention or desire to contravene the directions of the General Medical Council. It was quite true that Mrs. Webb was prosecuted, and he gave evidence in connexion with the three cases. His answer was that although he had not been present at the births, he had given his continued attendance subsequently. He had fully and carefully taken all the usual precautions and had kept in touch with the cases both by personal visit and by inquiries for about two weeks. In view of his continued attendances, he did not think he was "covering" an uncertified woman, and if he had done so, it had been done unintentionally. He was anxious to conduct his practice in conformity with the rules and wishes of the Council.

The PRESIDENT said: Mr. White, the Council has come to the conclusion that the facts alleged against you in the notice have been proved. These facts are that you by your assistance knowingly enabled Mrs. Elizabeth Webb, whose name had been removed by the Cental Midwives Board from the Roll of Midwives, to attend women in childbirth under cover or pretence that such women were attended or to be attended by you or by her under your direction, thereby enabling the said Mrs. Elizabeth Webb, in contravention of the Midwives Act, 1902, to practise as if she were certified thereunder. You so enabled her by notifying births, on her behalf, in cases attended by her, and by signing maternity benefit certificates which she was not qualified to sign. The Council, in the public interest, takes a very grave view of the danger which arises from a medical practitioner who lends his name for such a purpose, and "covers" the practice of unqualified persons, under whatever pretext they practise midwifery, and whatever may be his personal opinion as to their skill and capacity to attend women in labour. In order, however, to give you an opportunity of reconsidering your whole position in relation to this matter, the Council has postponed judgment in your case till the next session in November. Before that date you will be required to send to the Registrar of the Council the names of some of your professional brethren who may be willing to testify as to your character and conduct in the interval.

The next case was that of Henri Saturnin Hartley, registered as of 8, Sackville-street, Port of Spain, Trinidad, M.D. U.Laval, 1906, who had been summoned to appear before the Council on a charge of issuing certificates of successful vaccination without having seen, examined, or vaccinated the persons in question, and of having paid commission to the person who procured him to give the certificates.

The case was brought to the notice of the Council by the Medical Board of Trinidad.

Dr. Hartley attended in person and was accompanied by his counsel, Mr. J. H. Watts.

Mr. HARPER, the solicitor to the Council, explained the circumstances in which the charge was brought. The Medical Board of Trinidad held an inquiry into a charge practically identical with the one now brought forward, and as a result the practitioner's name was erased from the Medical Register of Trinidad. He read a petition by Dr. Hartley to the Medical Board of Trinidad for the restoration of his name to the Register of the colony which was refused.

Dr. HARTLEY gave evidence on his own behalf, denying the allegations.

At the conclusion of the hearing the PRESIDENT announced that the facts alleged against Dr. Hartley had not been proved to the satisfaction of the Council, and the complaint was accordingly dismissed.

The Council then considered the case of Andrew Robertson Dow, registered as of Silverhowe, College Park, N.W., M.B., Ch.B., 1902, U. Glasg., who had been summoned to appear before the Council on the following charge:—

That being a registered medical practitioner you were at the general session of the Central Criminal Court beginning on the 6th day of February, 1917, convicted of conspiring with other persons to defeat the provisions of the Military Service Acts, 1916, and were sentenced to nine months' imprisonment in the second division.

Mr. Robertson Dow attended and was represented by Mr. Ernest Wild, K.C., and Mr. Showell Cooper.

Mr. HARPER, the Council's solicitor, in bringing the case to the notice of the Council, put in the certificate of conviction. He said that the course which Mr. Dow had taken in the events which had led to the proceedings in court was to give three certificates to men who were seeking for total exemption from military service or to be placed in a lower category. In two cases these certificates stated that the man had been his patient for some time, which was contrary to fact.

Mr. ERNEST WILD, K.C., who addressed the Council on behalf of Mr. Dow, suggested that in the light of the small remuneration that Mr. Dow received for giving these certificates, and in the light of the diagnoses being honest diagnoses, he had been sufficiently punished for making a statement in the interest of his patients which was undoubtedly false. He appealed to the Council to give Mr. Dow one more chance.

The PRESIDENT (announcing the decision of the Council) said: Mr. Andrew Robertson Dow, I have to inform you that the Council have found it proved that you have been convicted of the misdemeanour alleged against you in the notice of inquiry and have directed the Registrar to erase your name from the Medical Register.

The Council adjourned.

FRIDAY, MAY 25TH, AND SATURDAY, MAY 26TH.

The Council resumed its sittings.

Penal Case.

The Council considered the case of Alfred Banks, registered as of Five Ways, Ryde, I. of W., M. 1891, F. 1893, R.C.S. Eng.; L.R.C.P. Lond., 1891, who had been summoned to appear before the Council on a charge of committing adultery with a patient whom he had been attending professionally.

Mr. Banks was not present, but he was represented by Mr. Hemmerde, K.C., and Mr. Le Bas. After hearing the case,

The PRESIDENT (intimating the decision of the Council) said: I have to announce that the facts alleged against Mr. Alfred Banks in the notice of inquiry have been proved to the satisfaction of the Council, and that the Council has adjudged Mr. Alfred Banks to have been guilty of infamous conduct in a professional respect and has directed the Registrar to erase from the Medical Register the name of Alfred Banks.

Reports of Committees.

Sir JOHN W. MOORE presented a report by the Public Health Committee on a new statistical table for the 10 years 1905–1914, giving the figures for the first examination and second examination for the qualifications in public health

[1] THE LANCET, 1916, ii., 987.

and on matters arising therefrom. The report stated that in the professional examinations held in 1916 for qualifications in sanitary science, public health, or State medicine the total number of candidates who presented themselves before all the examining bodies was 137. The figures for 1913 and 1914 were 626 and 589 respectively. These figures included both first and second or final examinations and passes and rejections. The report remarked that when now a qualification in medicine and surgery had been obtained there presented itself at once not merely an opening, but an urgent call, for the services of the new graduate for civil or military or naval work.

The report was formally received.

A report on exceptional cases was presented by the Students' Registration Committee.

The PRESIDENT submitted a report of the Pharmacopœia Committee. This report stated that the number of copies of the British Pharmacopœia, 1914, which were sold by the publishers between Nov. 26th, 1916, and May 19th, 1917, was 1099. The total number sold since May 20th, 1916, was thus about 28,134 copies. Of the second issue, published in May, 1915, about 450 remained in stock at the present date. The committee recommended that a third issue of 5000 copies should be ordered from the printers. The committee had had before them communications from a committee appointed by the Home Secretary to consider questions relating to economies in the use of drugs which, owing to the war, had become limited in supply. The communications referred in particular to official preparations containing glycerine and refined sugar. The committee recommended that the Council should delegate to them power to make on its behalf such official intimations on the subject as the existing conditions might render necessary. In briefly commenting on the terms of the report the President made reference to the restricted supply of sugar. It had been suggested to the committee that where possible there should be economy of sugar as an ingredient in preparations. If the Council would give the committee the power the latter would make temporary regulations.

The report with its recommendations was adopted.

A report of the Examination Committee was received on matters relating to the Apothecaries' Hall of Ireland.

Dr. KNOX moved the adoption of a recommendation of the committee to the effect—

That the Apothecaries' Hall be requested to continue to furnish the tables of exemptions from, and results of, examinations as heretofore, giving particulars of marks, and when the candidate had been previously examined by the Hall, and had passed some portion of the examination, the date of such examination. And that the report of Dr. William Taylor on the examinations held in December, 1916, be forwarded to the Apothecaries' Hall of Ireland for their information, with the request that they will favour the General Medical Council with any remarks they may desire to make, in time for the meeting of the Council in November, 1917.

Dr. MAGENNIS expressed the hope that the prolonged and exceptional inspections which he looked upon as persecution would not be continued.

The motion was agreed to.

Finance Committee's Report.

Mr. TOMES submitted the report of the Finance Committee, which showed that the income of the General and Branch Councils for the year ending Dec. 31st, 1916, was £7992 and the expenditure was £6997. That showed, said Mr. Tomes, that the financial position of the Council was satisfactory, and that there was a surplus of income over expenditure of about £1000. Owing to the conditions of the war there was considerable reason to anticipate that the next two years might be rather lean. The war had diminished the number of students who might take their qualification and registration, but later on the Council might hope to recover its receipts from the registrations which would take place in subsequent years. The Canadian medical men whose degrees and diplomas had been recognised here had to a material extent been absorbed in the Royal Army Medical Corps. Instead of registering some of them had taken it that being entitled to registration was the same thing as if they had actually registered.

The report was received.

Education Committee.

Dr. MACKAY intimated that the Education Committee did not bring forward a report this session. Last session certain changes as regards Latin were made in the preliminary examination which qualified for the universities. The question of Latin in the junior examination was remitted to the committee for further consideration. There was the question of the substitution of science for Latin in the junior school. The committee had been prepared to report on that subject, but the Government had appointed a committee to deal with the whole question of science teaching in secondary schools. In view of that fact the committee thought that it would be wiser not to bring forward the report now, but to hold it over to the next session.

Dental Representation on the Council.

Mr. THOMSON gave notice that at the next session of the Council he would move a motion in favour of legislation to secure direct representation of registered dentists on the General Medical Council.

Appointment of Committees.

The following committees were appointed:—

Examination Committee: Dr. Taylor, Dr. Elliot Smith, Dr. Caton, Dr. Russell, Dr. Cash, Dr. Norman Walker, Sir J. W. Moore, Sir Arthur Chance, and Dr. Kidd.

Education Committee: Dr. Norman Moore, Sir G. Philipson, Sir F. Champneys, Dr. Mackay, Mr. Hodsdon, Dr. Knox, Sir A. Chance, Sir B. Windle, and Dr. Dixon.

Public Health Committee: Sir A. Newsholme, Dr. Latimer, Mr. Verrall, Dr. Littlejohn, Dr. Cash, Dr. McVail, Sir J. W. Moore, Dr. Magennis, and Dr. Coey Bigger.

Dental Cases.

The Council, after consideration of a report of the Dental Committee referring to George Horatio Jones, who was registered in the Dentists Register on Oct. 8th, 1878, as "in practice on July 22nd, 1878," and whose address in the Register for the current year was Great Russell Mansions, Bloomsbury, London, W.C., directed the erasure of his name from the Dentists Register. The report had reference to certain advertisements.

The Council, after consideration of a report of the Dental Committee, directed the erasure from the Dentists Register of the name of James John Gordon Webster Clarke, who was registered on Dec. 24th, 1878, as "in practice on July 22nd, 1878," and whose address in the Register for the current year was 18, Waterloo Bridge-road, London, S.E.

The General Registrar.

Lieutenant-Colonel Norman C. King was reappointed general registrar.

The session then concluded.

THE CULTIVATION OF MEDICINAL PLANTS.

CONTRIBUTED BY A DRUG-GROWER.

THE communication from the National Health Insurance Commission for England to the Board of Agriculture quoted in the February number of the Board's *Journal* was useful in throwing the cold light of reasoned knowledge on a subject which has been largely dealt with by patriotic and enthusiastic amateurs. Even the leaflet 288 of the Board of Agriculture, on which much of the amateur herb-growing was based, seems to have been written and issued without very careful investigation of the subject. At all events, some of the important herb-growers in this country, who might be expected to know their own business and have actual knowledge of the practicability of the culture of most medicinal plants, were not asked by the Board for their opinion. On the other hand, before the Insurance Commissioners published their statement on the matter, they undertook very careful and thorough inquiries, the result of which is embodied in their communication to the Board of Agriculture.

Official and Non-official Plants.

In the first place, until the Insurance Commissioners' report appeared no attempt was made to differentiate between the drugs used in ordinary medical practice—i.e., the official B.P. drugs which are comparatively few in number, e.g., Belladonna, Hyoscyamus, Aconite, Taraxacum, Filix Mas, and Valerian—and the host of others which are used mainly by the so-called botanic druggists and herbalists, such as Agrimony, Mugwort, Wormwood, Betony, Figwort, and so forth. The Insurance Commissioners naturally devoted their attention to the official drugs, singling out from these four—viz., Belladonna, Hyoscyamus, Digitalis, and Colchicum—for serious consideration. All the other official medicinal plants which might conceivably be grown or collected in this country can be dismissed in a few words.

Aconite.—Its cultivation has probably never paid in England, and at the present time it is possible to secure an ample supply at prices not greatly in excess of the pre-war figure, large quantities having been imported from Spain.

Dandelion (Taraxacum) cannot possibly pay to cultivate, nor is it necessary to do so as it is so common a weed. The grubbing of the root is a toilsome and dirty occupation, unsuited for the usual amateur herb-collector. While the greater part of the supply of dandelion root is used for non-official purposes, there has been ample available for the preparation of the official extract and juice. Last autumn one firm alone received from the collectors 5 to 10 tons a week.

Couch grass (Agropyrum) is present in quantities in most arable fields, and large quantities are readily available if required. The amount used in medicine is trivial.

Male fern (*Filix mas*).—With this a curious difficulty has arisen. Manufacturers using English root have found themselves unable to produce an extract containing the proper proportion of filicin; the B.P. requires not less than 20 per cent. Possibly the English root does not contain as much of this principle as the continental owing to climatic conditions, or the root may have been gathered at the wrong season of the year. At a recent drug sale more than 20 bales of this root were offered but found no bidder.

Chamomile and Valerian.—Before the war the supplies came mainly from Belgium, and these will presumably be again available later. In the meantime, recourse has been taken to the Japanese product from a different species, stronger than the European variety, and to an Indian species which is also official.

There remain the four essential medicinal plants to which the Insurance Commissioners direct attention. Of these, there is no manner of doubt that the supply of wild *Digitalis* and *Colchicum* is sufficient. With the former the only difficulty is proper drying, but a little experience will be likely to ensure a good result. *Colchicum* is present abundantly in this country, but its harvesting presents one practical difficulty. It affects the best pastures, and as it must be dug in summer serious damage is done to the grass, farmers naturally requiring substantial compensation for their loss. This and the scarcity of labour make the present price very high.

Belladonna is, of course, far the most important of the four, and while great scarcity and famine prices have largely prevailed, large quantities are now under cultivation and ample supplies will probably be available this summer and certainly next, not only for the use of the medical profession at home, but also for export.

Hyoscyamus usually commands good prices, generally better than Belladonna, but it is a very uncertain crop and liable to attacks by insect pests which in some seasons completely destroy acres of plants in a few days. Occasionally it produces very heavy crops and is then decidedly profitable, but such years are rare, and between them will be many lean ones and some absolute failures. Its cultivation is therefore hardly suited to anyone of small means to whom a crop failure would be a serious matter.

The Difficulties of the Small Cultivator.

The prudent will bear in mind the experience with lavender 20 years ago. The great frost of 1895 destroyed a large proportion of the lavender plantations and misleading reports were published about a "dying English industry." The late Sir W. Gilbey interested himself in the matter, with the result that so much was produced within the next few years that the price dropped to a ruinously low figure, entailing much loss to the growers. In the cultivation of Belladonna, growers who are also manufacturers have an advantage over those who are growers only in being able to judge their own requirements and lay down a corresponding acreage of the plant. Certain British herb-growers have now five or six times as much land under medicinal crops as two years ago and expect to be entirely independent of outside supplies this summer. Large growers are in a position to employ up-to-date and extensive drying apparatus, and in this and other ways are at an advantage over the small grower, to whom, therefore, the caution of the Board of Agriculture may not be out of place. For the cultivator of an acre or two the provision of suitable drying plant, used only for a short period each year, is an expensive item. In a large business parts, if not all, of the drying plant can be used nearly all the year for one purpose or another. Unless, too, the small cultivator definitely secures a customer for his prospective crop at a fixed price before he sows it he runs a risk of not being able to sell at all. Unlike corn and potatoes, for which there is only too ready a market, the moment the demand for medicinal crops is met (and the demand is strictly limited) the crop becomes unsaleable.

The Collection of Wild Plants.

From a business point of view a safer outlet for the energies of the amateur drug-producer is in the collection of wild plants, remembering that, for the most part, these are used by herbalists. As soon as the supply is sufficient the collector ceases operations, and hence does not accumulate more than he can sell. The occupation, although healthy, is rather humdrum as well as toilsome. It should also be regarded as a war-time measure. Many of these drugs grow wild in parts of the world other than the Central Empires. France, Spain, Italy, Russia, India, and Japan produce much already, and will probably send more in the future. Such "crude" drugs are the raw material of the drug manufacturer, and, along with other raw materials, have not hitherto been considered a suitable object for a protective tariff.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

COMMITTEE FOR THE INVESTIGATION OF ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR THE MONTHS ENDING

Oct. 31st, 1916.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash	Soluble matter. Loss on ignition	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.											
Leicester	51	0·11	2·29	4·54	1·26	3·09	11·29	1·47	0·52	0·15
London—											
Meteorological Office	64	0·08	1·60	2·42	1·28	5·12	10·30	1·52	0·90	0·03
Embankment Gardens	42	0·11	3·08	2·83	6·16	12·46	24·65	5·55	0·14	0·05
Finsbury Park ...	52	0·11	2·10	5·87	2·60	4·24	14·93	2·59	0·53	0·02
Ravenscourt Park	96	0·14	1·82	4·71	3 81	5·75	16·22	2 88	0·94	0 16
Southwark Park	39	0·08	1·90	3·90	1·86	3·08	10·84	1·71	0·53	0·07
Victoria Park ...	39	0·03	1 50	3·74	2·06	5·66	12·99	3 18	0·54	0 06
Wandsworth Com.	39	0·04	0·95	2·78	0·99	2·94	7·68	1·33	0 45	0 05
Golden Lane ...	71	0·04	2·73	4·00	2·26	5·08	14·11	2 57	1·05	0·31
Manchester—											
Queen's Park ...	112	—	—	—	—	—	19·0	—	—	—
School of Technology	104	—	—	—	—	—	23·6	—	—	—
Newcastle-on-Tyne	62	0·36	5·78	15·92	5·61	14·45	42·12	4·51	5 30	0·15
York	65	0·16	2·63	5·71	2·60	5·19	16·34	2·72	0·78	0·09
SCOTLAND.											
Coatbridge	131	0·23	1·92	3·83	2·19	6·97	15·24	2·41	0·88	0 17
Greenock	213	0·31	3·23	5·80	4·47	7 45	21·27	3 70	1·54	0·25

Nov. 30th, 1916.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash.	Soluble matter. Loss on ignition.	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.											
Leicester...	60	0·13	3·50	8·62	1·56	3·36	17·18	1·59	0·38	0·16
London—											
Meteorological Office...	98	0·07	1·40	2·47	3·95	4·73	12·62	2·21	1·40	0·02
Embankment Gardens	42	0·32	1·46	6·64	1·08	2·47	11·97	1·12	0·91	0·07
Finsbury Park ...	81	0·12	1·86	4·33	1·68	3·52	11·51	1·90	0·63	0·06
Ravenscourt Park	104	0·29	1·95	4·08	3·63	6·71	16·64	2·77	1·47	0·13
Southwark Park	78	0·08	1·82	3·42	1·71	4·64	11·66	2·03	0·98	0·08
*Victoria Park ...	—	—	—	—	—	—	—	—	—	—
*Wandsworth Com.	—	—	—	—	—	—	—	—	—	—
Golden Lane ...	96	0·07	2·31	3·48	3·06	3·83	12·75	2·20	1·19	0·17
Manchester—											
Queen's Park ...	76	—	—	—	—	—	14·60	—	—	—
School of Technology	57	—	—	—	—	—	19·70	—	—	—
Newcastle-on-Tyne	78	0·14	5·15	13·11	3·58	8·25	30 23	2·46	2·76	0·11
York...	41	0·04	0·67	0·92	3·91	2 61	8·14	1·68	0 94	0·03
SCOTLAND.											
Coatbridge	86	0·13	1·97	3·84	2·03	5·23	13·20	2·24	0·58	0·20
Greenock	149	0·29	2·43	3·73	2·39	6·63	15·46	2·73	1·11	0·21

* Owing to frost no returns were available at Victoria Park and Wandsworth Common. At Exeter and Malvern observations have been discontinued owing to the war.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9lb. per acre; (*b*) 2 56 English tons per sq. mile; (*c*) one gramme per sq. metre; (*d*) 1/1000 millimetre of rainfall.

The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables.

THE JOINT MEDICAL CONFERENCE IN CHINA.

(FROM OUR OWN CORRESPONDENT.)

THE Joint Medical Conference, which was held in Canton from Jan. 24th to 31st of this year, will long be remembered not only for its great success but also as the first real attempt made by Chinese and foreign medical men to join forces in this land. It may be remembered that the National Medical Association, consisting of modern-trained Chinese medical men, was formed in Shanghai just over two years ago. Last year THE LANCET published the proceedings of its first Conference held in Shanghai, where, among other things, it was decided to hold the Conference of 1917 in Canton in conjunction with the China Medical Missionary Association. The membership of the Missionary Association is about 450 and that of the National Association close on 500. There were 64 foreign and 92 Chinese doctors present, including 34 women.

The organisers in Canton did all they could to establish a record. Both Chinese and foreign doctors formed strong committees and enlisted the powerful support of the Civil Governor of the province, Chu Ching Lan. Good as his record had been as an enlightened and democratic official, no one expected that the Governor would go out of his way so much to promote the success of the Conference. His Excellency not only attended the opening reception on the evening of Jan. 24th, but he entertained all the delegates and their wives, numbering 170 persons, to a banquet on the roof garden of the leading Chinese hotel, opened the public health campaign in the city, and personally conducted the delegates in two yachts to the historic suburb of Whampoo on the Canton River for a picnic. No wonder the foreign guests expressed a hope that Governor Chu (who is only 42) would become one day President of China, as ensuring the rapid headway of medical science.

Papers Read.

The President of the Medical Missionary Association was Dr. W. H. Venable, of Kashing, while that of the National Association was Dr. Wu Lien-Teh (G. L. Tuck) of plague fame. Sessions were held in the morning and afternoon and on two occasions in the evening as well, Dr. Venable and Dr. Wu presiding on alternate days.

The most interesting papers read were as follows:—

1. *Standardisation in Mission Hospital Work*, by Dr. H. S. Houghton, who referred to the waste incurred in a medical man having to keep books, watch the market quotations, plan the building of hospitals, and generally look after affairs which could with greater economy be done by other men. He laid emphasis upon the need for proper staffing and management, keeping records and skilful nursing. He advocated standardisation in statistics and accounts. All financial records should embody clearly administration, maintenance, capital expense, and purchasing. There should be a central purchasing agency for all hospitals, situated preferably in Shanghai.

2. *Medical Schools in China*, by Dr. H. H. Hume (Johns Hopkins and Changsha), who classified them according to provinces, cities, date of foundation, and language taught. He enumerated 26 colleges altogether in the country, some missionary, some under the Chinese Government, some private, some joint foreign and Chinese, and two purely female institutions. The largest in point of numbers was the Army Medical College in Tientsin, with nearly 350 students, while the best equipped, with the possible exception of Hong-Kong which he had not visited, was the German Medical College at Shanghai, where students received a preliminary language training of three years and a professional training of four years. The total number of medical students in China at this moment was under 1500, of whom 136 were women—a very small number.

3. *The Nature of Plague Proteotoxins*, by Dr. Fred. Eberson, bacteriologist of the Manchurian Plague Prevention Service. These researches, undertaken to discover a serum for plague more potent than any, dealt with the peculiar nature of the proteotoxin of *Bacillus pestis*, which is unlike that of *B. typhosus*. Dr. Eberson's conclusions are: (*a*) Powerful shock-producing poisons can be obtained by allowing normal guinea-pig or horse serum to act upon sensitised plague bacilli. (*b*) The proteotoxins of *B. pestis* are thermostabile, resisting prolonged heating at temperatures ranging from 50°-61° C. (*c*) A wide range exists within which the poisons may be obtained. The essential requirement is sufficient sensitisation of the plague organisms. (*d*) Proteotoxins are obtainable even after considerable exposures, the average being 14 hours, sometimes 18 hours. (*e*) The mechanism of plague infection seems to depend upon a primary sensitisation of the organisms, the antigen-sensitiser complex being important for poison production.

4. *Placenta Prævia*, by Dr. R. W. Gibson (Hong-Kong). He enumerated the dangers of this serious complication in childbirth and produced statistics to show that it was more common among Chinese primiparæ than among Europeans, the proportion being 17 per cent. to 4·4 per cent. These cases were always serious for both mother and child, and occurred in the seventh to eighth month of intra-uterine life. He advocated podalic version, and a brisk discussion ensued.

5. *Spinal Anæsthesia Produced by Tropacocaine.*—Dr. Cheng Ho (Canton) described the technique and enumerated a considerable number of major operations which he had done by this method. He recommended its general use where general anæsthesia was dangerous—e.g., in cases of heart or lung trouble.

6. *The Menace of Morphine*, by Dr. Wu Lien-Teh, who drew attention to the enormous increase in the output of morphine from British firms in Great Britain and its smuggling by Japanese agencies into China. In 1911 the declared export from Great Britain was 208,540 ounces, or 5½ tons; in 1914 this had increased to 504,020, or 14 tons. He urged everyone present to support a resolution to be sent to the Chinese and British Governments and other medical bodies to act without delay upon the articles of the Hague Opium Convention signed on Jan. 23rd, 1912.[1]

7. *Diabetes*, by Dr. H. G. Earle, of Hong-Kong University, who after outlining the various theories of its causation, invited discussion on its treatment. He himself considered absolute starvation the best. In this he was supported by other speakers.

8. *The Work of the China Medical Board of the Rockefeller Foundation*, by Mr. R. S. Greene, resident director of the Foundation in China. He outlined the work in various educational centres, including two large medical schools in Peking and Shanghai, and the considerable financial support accorded to the Union Medical College at Tsinanfu, Red Cross Hospital (Shanghai), Changsha and Canton, as well as the foundation of scholarships and fellowships to Chinese and foreign doctors, pharmacists, and nurses. The assistance rendered by the Rockefeller Foundation to medical education in China has been very considerable during its three years' activity in China.

Other Proceedings.

The Research Committee reported what had been accomplished during the last two years. This comprised work done on "Pelvic Measurement," "Height, Weight, and Chest Measurements," "The Circulation," and "Normal Blood." This attempt to find a normal or physiological standard among Chinese may become very valuable; already much good work in a similar direction has been conducted by a physiological chemist in Tsinanfu on "The Diet of Chinese." Such investigations as this and as those so excellently carried on by the Plague Prevention Service show how progressive the study of medicine is becoming in China.

Considerable interest was aroused by the presidential address delivered by Dr. Wu Lien-Teh on "Some Problems before the Medical Profession in China." He alluded to the prevailing ideas among the conservative Chinese regarding the medical profession, and said that the Japanese were trying more to adapt Western medical science to the needs of the people, and that it was necessary for their Western colleagues not to fall behind. He advocated the formation without delay of a Central Medical Council corresponding to the General Medical Council of Great Britain, with functions similar to those possessed by that body.

Two resolutions were passed in joint session of the Conference, the first drawing the attention of the Government to the need of adopting measures to prevent the morphine habit, and the second to the need of the establishment of a Central Medical Council in Peking, whose duties should be the fixation of a minimum standard of general education, the maintenance of a student and medical register, the drawing-up of laws and regulations affecting the medical profession, and the adoption of a medical nomenclature in Chinese.

The Conference terminated on Jan. 31st, after an election of officers for the next two years. The new President of the Medical Missionary Association is Mr. C. J. Davenport, F.R.C.S. Eng., surgeon to the Shantung-road Hospital, Shanghai, while Dr. Wu Lien-Teh was re-elected for a further term of two years as President of the National Association. The next place of meeting will be Peking, in 1919. There is no doubt that a joint conference is the ideal to be aimed at by those who wish to see medical science make rapid headway. Both sides can mutually help one another, and there is every evidence that the next two years will see even greater progress.

Canton, March 16th.

[1] We hope to publish a fuller note on this paper.

THE annual general meeting of the South London Hospital for Women, Clapham Common, will be held at 5, Carlton House Terrace, S.W., on Wednesday, June 6th, at 3.15 P.M. The Marchioness of Londonderry will preside, and among the speakers will be Dr. Lina Potter, who will give her experiences in Russia, and Dr. Jane Walker.

HOSPITAL DISPENSER FOR 49 YEARS.—The death occurred recently at Shoreham of Mr. E. Fenner, who for 49 years was dispenser at the Royal Sussex County Hospital at Brighton. On his retirement from the office the governors, as a mark of their appreciation of his work, elected him a life governor of the hospital. His only son, a captain in the veterinary service, succumbed to wounds while in captivity during the South African War.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Welfare of Mothers and Children in Ireland.

A REPORT on the physical welfare of mothers and children in Ireland has been compiled for the Carnegie United Kingdom Trustees by Dr. E. Coey Bigger, the Medical Commissioner of the Local Government Board for Ireland, and was issued last week. It is an exhaustive and acute study of the causes underlying maternal and infantile disease and mortality, together with suggestions for improvement of present conditions. It gains added force from the strong feelings which have inspired the author. Dr. Bigger points out the special importance of the subject at present, when so many of the healthiest and fittest of our manhood, those who should be the fathers of the next generation, are losing their lives on the battle-fields of Europe. "The newly-born infant has less chance of living till this time next year than his father who is fighting out in France." It is true that the infant death-rate in Ireland—92 per 1000 births—is lower than that in England (110) or in Scotland (126), but whereas the rate in England has been steadily falling for many years past, in Ireland there has been little improvement. Dr. Bigger gives a table showing the geographical distribution of infant mortality, and from this it appears that in no less than eight counties the infant mortality is less than 60 per 1000. In only three counties—Antrim, Kildare, and Dublin—is the mortality over 100 per 1000. In each of the six county boroughs, however, the mortality is high, ranging from 108 in Limerick to 160 in Dublin. The greatest mortality is in the first few weeks of life, as, for example, in the Dublin registration area, where almost exactly one-third of the total deaths in the first year occur in the first month. From this fact it is clear that any scheme to diminish infant mortality must include consideration both of the health of expectant mothers and of the conditions under which child-birth takes place. Dr. Bigger gives reasons for believing that the most fatal of infantile diseases are bronchitis and pneumonia, the next group being diarrhœa and enteritis. Bronchitis and pneumonia would seem to be diseases that could be fairly readily prevented if mothers were better educated as to the means of preserving the health of their children.

The average puerperal death-rate for the past ten years has been a little over 2 per 1000 births. There is no Midwives Act in force in Ireland, and many of the confinements are attended only by "handy women." A marked proof of the value of skilled attendance at childbirth is shown by the fact that whereas the maternal death-rate in Dublin was 4·5 per 1000 in 1915, the rate among the patients attended by the Rotunda Hospital was only 2·3 per 1000. In giving this contrast its full value it is to be remembered that the Rotunda Hospital cases included many sent to the hospital on account of difficulties or complications.

Dr. Bigger has made a study of the economic conditions of working-class families, and he shows that before the war the wage of the agricultural labourer varied from 11*s.* to 15*s.* a week, while the average wage of the unskilled labourer in Dublin was 16*s.* 7½*d.* On such a wage it was impossible to support a wife and family in health. He adds:—

The tenement system of housing is largely responsible for the high mortality in the towns, because of the scanty water-supply, bad sanitation, and overcrowding of these tenement houses, which are mostly let in one- or two-room dwellings. That better housing can effect an enormous reduction in infant mortality is proved by the statistics of the Peabody Buildings in London. In these the density of the population was 504 persons per acre, but only 1·8 per room, and the infant mortality rate in them was 92 per 1000 when the rate for London was 120. It is therefore domestic not municipal overcrowding that is the important factor.

In parts of the North-East of Ireland it is the custom for girls to work as "half-timers" in the spinning-mills from the age of 12. These girls learn nothing of housecraft, and their health is bound to suffer from work at such a tender age. They often marry early. "Is it any wonder," says Dr. Bigger, "that a large proportion of the children of such mothers either die or are permanently disabled? ..... The manufacturers who employ 'half-timers' are contributing to the perpetuation of a great national wrong which cries aloud for redress."

I do not try to follow Dr. Bigger through the entire report, but I quote some of the more important of the recommendations with which he concludes:—

(1) A Midwives Act for Ireland; (2) schemes for the instruction of expectant and nursing mothers, and the establishment of infant and child-welfare centres; (3) the extension of the boarding-out system and the detention of mothers of illegitimate children for at least three months; (4) the extension of the Provision of Meals Act to rural districts, and a grant-in-aid from the Treasury for that purpose; (5) a scheme for the medical inspection of school children; (6) the raising of the age of girls allowed to work in factories to 15 years, and the establishment of a system of full-time medical officers of health; (7) improvement of housing conditions, the abolition of slums, and power to urban district councils to provide houses for the poorer working classes; (8) the establishment of milk depôts and more vigorous and uniform enforcement of the Dairies, Cowsheds, and Milkshops Order of 1908, with provision in large towns for bacteriological tests for the detection of tubercle bacilli in milk; (9) State-aid for parents of the poorer classes as a grant for each child.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Duration of War-deafness.

THE term war-deafness has been given to the deficiencies of hearing produced by the sudden change of pressure when a projectile of large calibre explodes. Three kinds of lesions have been distinguished affecting: (1) the middle ear alone (18 per cent.); (2) the middle and internal ear (57 per cent.); (3) the internal ear alone (25 per cent.). In the last case the injury leaves no visible effect. It has been said that 98 per cent. of these cases of deafness recover spontaneously; but Dr. Marage has recently brought before the Academy of Sciences evidence to show that this is not true, for lesions of the middle ear leave behind, after clinical recovery, more or less pronounced deafness which impairs the efficiency of officers, non-commissioned officers, and telephonists. In the 25 per cent. of cases of deafness due to disturbances of the internal ear without apparent lesions spontaneous recovery should be shown by an increase of auditory acuity proportional to the length of time since the injury was received. This was not the case. In 150 cases of deafness of 2–14 months' duration investigated by Dr. Marage the average of auditory acuity remained equally bad whatever the date of the lesion. Re-education is therefore an imperative need for these cases.

Intrascapular Fracture of the Hip Treated by Grafting.

M. Pierre Delbet reported recently to the Academy of Medicine on the results in fracture and pseudarthrosis of the neck of the femur treated by a method of his own. While extra-articular fractures when suitably treated consolidated by formation of bony callus leaving only slight weakness, intra-articular fractures through the surgical neck or with complete separation of the head resulted in pseudarthrosis with more or less complete disablement. This was the more regrettable since, contrary to accepted theory, intra-articular fracture was the rule among young people. Hitherto no satisfactory treatment has been devised. M. Delbet employs grafts of 6½ cm. to 11 cm. in length, according to the size of the neck of the femur, completely stripped of periosteum and becoming actually part of the living bone. Proof of this was furnished not only by successive radiographs made over a period of 2–3 years, but also by the fact that the separate portions of broken grafts became consolidated. The rapidity of the restoration of function after operation depended on the duration of the pseudarthrosis and the extent of the secondary muscular atrophy. The duration of the disablement was much reduced in patients thus treated at the outset, and M. Delbet estimates that in future it should not exceed that in ordinary fracture of the femur. The long duration of pseudarthrosis is a troublesome factor, inasmuch as it renders regeneration of bone difficult, if not impossible, and because the absorption of bone which has occurred by enlarging the space between the fragments necessitates a larger graft and exposes it to the risk of breaking. Delay does not, however, constitute an absolute contra-indication to operation. Nor is age in itself a drawback. Of the 15 cases treated by M. Delbet one must be excluded, that of a much debilitated woman of

66 years who became paralytic in the course of treatment. Of the remaining 14 cases, only one failed to derive benefit—namely, a woman of 59 years, excessively obese, suffering from multiple dry arthritis, who died within a year of operation without regaining her ability to walk. The 13 other patients are walking, three of them still improving. One of these, operated upon three months ago, already walks so well that reasonable doubt might arise as to the existence of a fracture. Another, operated upon four months ago, cannot yet dispense with a stick. The same is the case with a woman who has fractured her graft.

Trench Hemeralopia.

In a communication to the Academy of Medicine M. Aubaret noted that while disturbances of vision at night are fairly frequent at the front the number of cases of true hemeralopia is relatively small. The distinction of pseudo-hemeralopia from true hemeralopia is not difficult. True hemeralopia appears in several forms according to the site of insufficient adaptation—pupillary (a fairly frequent form), retinal, or cerebral. Cases of insufficient adaptation were found amenable to treatment with atropine. For faulty retinal or cerebral adaptation smoked glasses of a fairly high degree of obscurity, Nos. 4–5, worn during the daytime were found of service. In all doubtful cases of hemeralopia care should be taken to improve the general condition; physical and mental rest, the exhibition of tonics and reconstituents, and a routine of diet conducive to the elimination of toxins are the measures indicated.

Obituary.

MAJOR GREENWOOD, SEN., M.D. BRUX., L.R.C.P. LOND., M.R.C.S. ENG., D.P.H., LL.B. LOND.

Major Greenwood, the deputy coroner for North-East London, who died on May 16th, aged 63, in Hackney, where he had long resided, came of a family which had long been established in the East-End of London. He was the son of the late Dr. Major Greenwood of Dalston, and was educated at the Merchant Taylors' School, whence, in 1873, he obtained a Buxton scholarship at the London Hospital. He qualified in 1876, taking the M.R.C.S. Eng., and the L.R.C.P. Lond. in the following year, and held various resident appointments at the hospital. Later he became resident medical officer to the North-Eastern Hospital for Children, now the Queen's Hospital for Children, and on leaving this appointment he settled down to general practice first in Dalston and later in Hackney. But at the same time he displayed his energetic temperament by joining Lincoln's Inn and reading for the Bar. In 1887 he took the M.D. of Brussels and in the same year the D.P.H. of the Conjoint Board, and in 1894, having been called to the Bar, he took the LL.B. Lond.

The mere enumeration of Dr. Greenwood's appointments will show how active he was professionally, politically, and socially. He was, in addition to being a busy medical man and a deputy coroner, senior district surgeon to the City of London Lying-in Hospital, public vaccinator for Haggerston and medical officer for No. 5 District of St. Leonard, Shoreditch, medical officer to King Edward's Industrial School, treasurer of the Brussels Medical Graduates' Association, secretary of the Poor-law Medical Officers' Association, Vice-President of the Medical Defence Union, and a member of the Central Council and President of the Metropolitan Counties Branch of the British Medical Association. In the activities of the British Medical Association he played a valuable part in many capacities.

Major Greenwood was a voluminous writer along lines of widely differing directions. He was the editor of *Poor Law Supplement*, the author of monographs on zoology and vaccination, and of essays on the Great Plague of London and other subjects of historical and literary interest. He obtained a prize in 1894 for an essay in the *Law Students' Journal* upon the Responsibility of Judges, and in the same year he published a note summarising the claims of the two professions, law and medicine, on the coronership. He wrote also an exposition of the Law Relating to Poor-law Medical Service, and a story of medical life, entitled "John Armstrong." It will be gathered that Major Greenwood was an exceedingly busy man, and all the numerous public and private claims upon his time received from him just acknowledgment. His wide experience, courage, and industry earned for him the regard of the large section of the medical profession to whom he was known personally or through his works, and where controversy ran high in medical politics he allowed no personal feelings either to mar his relations with opponents or to diminish his zeal in the cause of medical reform.

Dr. Major Greenwood leaves by his first wife a son, Captain M. Greenwood, R.A.M.C., of the Lister Institute of Preventive Medicine. In 1906 he remarried, and his widow survives him. To her and to Captain Greenwood we address our sympathies.

THE SERVICES.

ROYAL ARMY MEDICAL CORPS.

Capt. (temp. Major) J. Owen relinquishes his temporary rank.

Major William C. Croly to be acting Lieutenant-Colonel whilst in command of a Field Ambulance.

Capt. C. Woollard, C.A.M.C., to be temporary Major.

Temp.-Lieut. W. F. Gibb to be temporary Captain.

Temporary Honorary Lieutenants to be temporary Honorary Captains while serving with the Welsh Hospital, Netley: E. V. Jones and J. Boyd.

Officers relinquishing their commissions:—Temporary Captains: A. D. Forbes, R. V. Dolbey, J. I. M. Jamieson, and L. J. J. Nye, and J. H. P. B. Barrett, on account of ill-health. Lieutenants: E. C. Smith, F. H. Hurlburt, G. T. Griffith, A. J. Shilstra.

Lieutenants to be Captains: D. Loughlin, L. J. F. Bull, M. St. C. Hamilton, H. M. Wharry, J. P. Bracken, P. R. E. Kirby, E. H. V. Hensley, C. E. Bond, R. C. Davenport, R. H. Yolland.

To be Lieutenants: A. Rose-Innes, J. P. Williams, E. V. Beale, C. K. Mowll, D. Cameron, H. N. Pritchett, R. S. Corbett, H. W. H. Holmes, from University of London Contingent, O.T.C.; W. J. Walters; J. M. Norman, from Edinburgh University Contingent, O.T.C.; A. L. Packham; G. R. Hubbard; C. G. S. Milne from Aberdeen University Contingent, O.T.C.; S. Vidot; T. P. Chapman from Dublin University Contingent, O.T.C.; E. D. Roberts; W. J. Walters.

Second Lieut. A. Robertson, from Unattached List, T.F., to be Lieutenant.

Captains relinquishing their commissions: A. W. B. Loudon, A. Ramsbotham, W. F. Munro, W. H. P. Hey, K. W. Jones, D.S.O.

TERRITORIAL FORCE.

Lieut.-Col. (temp. Col.) W. K. Clayton relinquishes his temporary rank on vacating the appointment of Assistant Director of Medical Services, and is restored to the establishment.

Lieut.-Col. (temp. Col.) R. Pickard, C.M.G., relinquishes his temporary rank on vacating the appointment of Assistant Director of Medical Services, and is restored to the establishment.

Capt. (acting Lieut.-Col.) J. W. Mackenzie relinquishes his acting rank on alteration in posting due to reorganisation.

Major (acting Lieut.-Col.) F. B. Treves relinquishes his acting rank on alteration in posting due to reorganisation.

Capt. (acting Lieut.-Col.) R. Waterhouse to relinquish his acting rank on alteration in posting due to reorganisation.

Capt. (temp. Major) L. M. V. Mitchell relinquishes his temporary rank on alteration in posting due to reorganisation.

Capt. (acting Lieut.-Col.) H. N. Barnett relinquishes his acting rank on ceasing to command a Field Ambulance.

Capt. R. A. Broderick to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. (temp. Lieut.-Col.) E. Alderson reverts to the temporary rank of Major on ceasing to command a Field Ambulance.

Major (temp. Lieut.-Col.) W. M. Sturrock relinquishes his temporary rank on alteration in posting.

Majors to be temporary Lieutenant-Colonels: H. B. Roderick, A. Cooke, F. W. Burton-Fanning.

Captains to be temporary Majors: W. Tyson, H. A. Cookson, M. G. Foster, J. H. Thursfield, H. W. Wilson, F. D. S. Jackson, W. S. Colman, E. R. Carling, G. A. Ewart, J. Everidge, D. H. de Souza, A. J. Jex-Blake.

Major F. J. Steward to be temporary Lieutenant-Colonel.

Lieut.-Col. Sir J. K. Fowler, K.C.V.O., is restored to the establishment.

Major G. N. Biggs to be temporary Lieutenant-Colonel.

Major J. G. Martin to be acting Lieutenant-Colonel whilst commanding a Casualty Clearing Station.

Capt. P. G. Williamson to be Major.

Capt. C. Mearns to be Captain.

Captains restored to the establishment: A. Ramsbottom, W. F. Munro, A. W. B. Loudon, K. W. Jones.

Capt. R. E. Bickerton, D.S.O., to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Major (temp. Lt.-Col.) J. C. S. Burkitt relinquishes his temporary rank on alteration in posting.

Major (temp. Lt.-Col.) W. S. Kerr relinquishes his temporary rank on ceasing to command a Field Ambulance.

Capt. (acting Lt.-Col.) F. D. Blandy relinquishes his acting rank on ceasing to command a Field Ambulance.

Capt. (temp. Maj.) W. Blackwood to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. W. H. P. Hey is seconded for service overseas.

To be Lieutenant: J. Waterston.

Lieutenants to be Captains: W. J. Wilson, D. Lyon, R. E. Pitts.

Lieut.-Col. A. A. Watson relinquishes his commission.

Capt. F. Smith relinquishes his commission on account of ill-health.

Capt. S. Hughes relinquishes his commission on account of ill-health, and is granted the honorary rank of Captain.

Capt. H. G. Smeeth relinquishes his commission.

Correspondence.

"Audi alteram partem."

THE LATE SIR VICTOR HORSLEY.

To the Editor of THE LANCET.

SIR,—Last July came the news of Sir Victor Horsley's death in Mesopotamia. We ought to have some record of his life and of his work; we cannot afford to forget him and what he did for medicine and surgery. I am collecting notes for a book; I hope that it will plainly show what we lost when we lost him. I ask for help in this venture from his friends and colleagues, and from the many patients in hospital practice or in private practice who have reason to be thankful for his skill and his kindness. I want all that they can tell me of him, and any letters of his which they will let me use. Without their help nothing that I can write of him will be of much service to anybody. Great care will be taken to return all letters.—I am, Sir, yours faithfully,

21, Ladbroke-square, W.11, May 24th, 1917. STEPHEN PAGET.

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—It has necessarily been a terrible shock to me to receive such a snub from Sir James Mackenzie in your last issue. When Olympian Zeus frowns the world must needs tremble. And what of the unfortunate individual? I, however, console myself to this extent, that the majority of those who are interested in the progress of heart disease are aware that from 1900–13 no year has gone by in which my collaborators and I have not endeavoured to throw some new light on the problems of rheumatism and heart disease. In passing, I would correct his statement that the microbe was "my discovery." First described in 1899 by Wassermann, it was worked out in the various lesions and demonstrated by Dr. Paine and myself in 1900. This work took two years and was overlapped by Wassermann, who got home first on rheumatic arthritis.

That the discovery has been therapeutically and clinically sterile is in its turn a discovery—Sir James Mackenzie's discovery. It is hardly, I think, yet corroborated by the numerous clinical assistants who have kindly worked with me, or by the hundreds of rheumatic children and many adults I have supervised in the last 18 years. Such corroboration, however, necessarily takes time. I regard it as a kindly act on his part to indicate how I should have worked and be working at the subject instead of bawling "my discovery." Yet I am embarrassed to this extent that already (1900–1905) I had shown with Dr. Paine that an important site of entrance of the infection, long suspected, was the tonsillar region, and that already in my writings on heart disease and rheumatism in children I have described the earliest stages and their clinical importance. I should have done more I admit, but the routine of a general physician is arduous. For at least ten years steady preventive work has been done on the throat and nose both at University College Hospital and the Hospital for Sick Children, and I should have hoped, nay even expected, that it would have reached Sir James Mackenzie by A.D. 1917.

I would assure him I am not at all at a loss as to what to do with "my discovery." I am aiming at the prevention of rheumatic heart disease in childhood, and need the assistance of our profession. This is a long affair, not so rapid, for example, as a polygraph tracing. I am aiming at the arrest of the advance of heart disease in childhood by, among other steps, the institution of special rest-homes. I am trying to take my part in persuading our profession that salicylate of soda is not a specific remedy. Lastly, I am trying to introduce a modern study of heart disease based upon the development of infective heart disease in childhood. The study of heart disease in general terms is at present upside down, and I want to put it the other way up. When I have succeeded, which will not be at once, heart affections will be placed in their correct perspective in human ailments—a decided advance, I think, if we may judge by many of the recent writings. The peculiarities of adult cardiac disease will then also be recognised in the process of evolution. I have other aims, but those enumerated will probably suffice to occupy the rest of my life-time.

I am, Sir, yours faithfully,

Devonshire-place, W., May 26th, 1917. F. JOHN POYNTON.

TUBERCULOSIS AND THE WAR.

To the Editor of THE LANCET.

SIR,—At one time I was probably as enthusiastic for sanatorium treatment as Dr. E. E. Prest[1]; in fact, when in Parliament, and later, I had a good deal to do with the agitation which resulted in the erecting of a sanatorium of 370 beds in Western Australia. When in charge of the Coolgardie Sanatorium, however, I found that some patients treated in their own homes did better than any similar cases treated in the sanatorium. When I came to England to study the problem of the relation of dispensary to sanatorium treatment for tuberculosis, I was fortunate in being appointed to my present position for the duration of the war, which has a large dispensary as well as a small sanatorium of 27 beds. This has given me the opportunity I sought. The conclusion to which I have come after two years of study of that phase of the question is that, although for a certain number of tuberculous patients sanatorium treatment is not only beneficial but essential, in the majority of the really early cases a sanatorium is not only not necessary but inadvisable.

Dr. Prest and I would probably differ in our definition of an "early case." I would probably consider his "early case" further advanced as we both appear to differ as to the meaning of "cured." What he would consider cured I would consider as arrested. To me an early case is one which used to be considered as incipient phthisis—that in which the individual's resistance to the tuberculous invasion is threatened. In the same way the so-called cured cases are, to me, cases in which resistance has been re-established. The fact, however, remains that in a large number of cases the resistance can be re-established without sanatorium treatment, and this especially holds of the working class, where it will be frequently discovered that the cause of loss of resistance is working overtime or undue strain of some kind which can be relieved, though in a number of these cases it cannot be done except in a sanatorium. It is the insistence on the need for sanatorium treatment in all cases that does so much mischief and makes many people hesitate, when they suspect tuberculosis, to have their suspicion verified.

This year and last we had 104 cases working, earning full wages and attending the dispensary, and of these only four have died from any cause, and only three have had to be taken from work and are going downhill. I have about 60 cases a month sent to me for diagnosis, of whom about half show definite evidence of what may be considered active tuberculosis, and there are some 800 cases under observation. Our funds and opportunities allow about ten beds in the sanatorium each month. With proper supervision this is sufficient for the treatment of all cases in Class 1.

The great problem that at present needs serious consideration and discussion is not "how to send all cases to a sanatorium," but "When is sanatorium treatment necessary and beneficial, and how many beds are necessary for those cases who can by that means have their resistance raised?" This is essentially a question for the dispensary to solve, where all classes of cases are seen during their whole time, not one or two classes for part of their time.

The present interest in the matter gives hope for a future settlement of this question of national importance, and its foundation must rest on the information acquired in a tuberculosis dispensary and the administration of the National Insurance Act. I am, Sir, yours faithfully,

HENRY A. ELLIS.

Tuberculosis Dispensary, Middlesbrough, May 21st, 1917.

THE TECHNIQUE OF LUMBAR PUNCTURE.

To the Editor of THE LANCET.

SIR,—In reference to the correspondence on the subject of what Dr. T. J. Horder aptly terms a restricted flow from a tense theca I should like to add a few observations from my personal experience gained from 1100 punctures performed on cases of real or suspected meningitis.

[1] See THE LANCET, May 5th, 1917, p. 700.

In the first place a restricted flow may occur drop by drop, simulating the normal rate, or, on the other hand, five or six drops may run in rapid succession, followed by a pause. This latter phenomenon would at once suggest that the mouth of the cannula was not lying free in the arachnoid space. Another point is that when such a restricted flow occurs the respiratory movements are not imparted to the column of fluid. The explanation of this occurrence must of necessity be largely a matter of conjecture. A possible explanation is furnished by the surmise that the dura mater is pushed in front of the needle and then pierced, the mouth of the cannula thus lying in a narrow chink between the approximated dorsal and ventral dura mater. The dura mater is bound to the bony canal by loose areolar tissue which could be easily separated by a comparatively blunt needle. In this regard I may remark that this contretemps occurs most frequently when the needle fails to reach the theca at the first plunge and has already struck bone. Further, I have more often met with this difficulty at the end of a series of eight or ten operations on different patients when the same needles had to be reboiled and used a second time. The simple manœuvre of gently withdrawing the needle will frequently establish a good flow, possibly by widening the interval between the surfaces of dura mater. Rotation of the needle will in some instances establish a full flow, particularly if the needle has been introduced in such a way that the mouth of the cannula does not look directly towards the cephalic aspect of the arachnoid space. If these manœuvres fail a full flow will always be obtained by taking a sharp needle and selecting another space. A "dry puncture," except in cases of hydrocephalus, I take to be proof-positive that the needle has not entered the theca. Where the fluid is thick and purulent and a good flow cannot be obtained even with the assiduous use of the stylet it seems probable that, as Dr. Horder suggests, the needle may have entered a loculus. A fresh puncture at another level will often secure a more abundant flow. When the fluid is blood-tinged and not obviously purulent it is better to perform a fresh puncture in order to obtain fluid free from blood for cytological examination. I have rarely found fluid blood-stained on a second puncture at another level.

I am, Sir, yours faithfully,

MICHAEL FOSTER,

British Expeditionary Force, May 22nd, 1917. Captain, R.A.M.C. (T.).

TRENCH SHIN.

To the Editor of THE LANCET.

SIR,—While greatly interested in Lieutenant-Colonel Graham Chambers's paper on "Trench Shin" in your issue of May 19th, experience does not lead one to agree with all he has to say regarding etiology and treatment. Opportunities for observing this complaint have been incessant during two and a half years' work with a battalion on the Western front, though there has been no chance of following up the more severe cases. If the disease is micro-organic in origin and possibly infective, which seems probable, constriction and exposure must play a very minor part. Last winter this battalion suffered more from exposure and deep mud than even in 1914, yet more cases are occurring now when the weather is good and the recent fighting has been more or less in open and clean country. Experiences in 1915 and 1916 bear this out. If the puttee played an important part as a causative factor, one would expect far more cases in the infantry, and the incidence of the disease (like the wearing of the puttee) to be continuous. The name "infectious fibrositis" precludes constriction and exposure. Those who previously held that trench foot was due to the tight puttee, and others who now hold it to be an infection with *Scopulariopsis koningii* from contact with mud, will both doubtless find analogical comfort in this paper on "Trench Shin."

With regard to experimental treatment, in slight cases, one's energies are naturally limited by the medical pannier. The pain is most intractable; to relieve it and so give sleep, aspirin, phenacetin, and sodium salicylate quite fail in small or large doses; opium has disadvantages; in fact, morphia injections alone are reliable, and they of course cannot be repeated indefinitely. The pain is greatly increased by constriction and bandaging; lessened by gentle massage and the use of liniments. Complete rest, unless the pyrexia is marked, does not seem so desirable as "light duty," because the pain is at its worst when resting. Elevation of the legs is indicated. The disease seems self-limiting, and tonics and rest usually restore the health in from 10 to 30 days. After careful inquiry and observation, the much suspected and often guilty louse has been let off with a caution as being the cause of "trench shin"; for the worst cases have often occurred among the cleanest N.C.O.'s and men. On the other hand, officers in this battalion—usually free from lice—have never been sufferers.

I hope Lieutenant-Colonel Graham Chambers will take this not so much in the light of a criticism of his paper as a statement of the experiences of the writer.

I am, Sir, yours faithfully,

IVAN C. MACLEAN,

B.E.F., France, May 26th, 1917. Temporary Captain, R.A.M.C.

THE PARAFFIN TREATMENT OF BURNS.

To the Editor of THE LANCET.

SIR,—As chief surgeon of a Russian flying surgical column for two years, and of one of the largest Russian field hospitals for the past seven months, I have had the handling of a good many cases of burns, frost-bites, and scalds, and was at my wits' end, so to speak, for a treatment that would relieve pain, promote healing, and at the same time act as a disinfectant. About a year ago I heard about the paraffin treatment used in France. Unfortunately, it was practically impossible to obtain any of this remedy. I have, however, been using for nearly a year the following formula:—

Resin, 1 part; beeswax, 1 part; paraffin, 4 parts. Melt in a dish set in boiling water for half an hour. I put it on the same way as the French remedy is used. With a metal spray, spray on a thin coat, then cover with a very thin layer of cotton. Then with a camel's-hair brush put on three or four layers of the wax. After it has hardened for 10 minutes bandage.

Frozen toes, fingers, and ears respond splendidly. In scalds (we have many on account of the Russian steam baths) the pain is entirely stopped at once, and the skin heals readily. Burns from the German liquid fire are often very deep, the pain and suffering is intense, yet after applying the wax the patients soon go to sleep. Care must be taken not to let any water get into the wax. Only a small patch should be sprayed at a time, and covered with a thin layer of cotton while the wax is still hot. Another area should then be sprayed until the whole wounded surface is covered. Finally, with long strokes of the brush, redipping with each stroke, the whole area is gone over again. A new covering is put on each day until there is no further sign of pus, then every two or three days. I am, Sir, yours faithfully,

EUGENE HURD,

Russian Front, April 9th, 1917. Surgeon-Colonel.

THE INSTITUTE OF MASSAGE AND REMEDIAL GYMNASTICS.

To the Editor of THE LANCET.

SIR,—In the April number of the *Journal of the Incorporated Society of Trained Masseuses* an account was given of the formation, of the Institute of Massage and Remedial Gymnastics and a more or less accurate description of the negotiations which took place up to the conference between delegates of the advisory board and of the council of the Incorporated Society of Trained Masseuses on the one side and of the Institute of Massage and Remedial Gymnastics on the other side. The article ends with the following paragraph:—

> The representatives of the newly formed Manchester Institute who attended the conference mainly directed their remarks to criticising the methods and constitution of the Incorporated Society of Trained Masseuses, and the conference broke up without any tangible result being attained.

In the notes of the conference made by the advisory board of the Incorporated Society of Trained Masseuses the following paragraph occurs:—

> It was decided that no shorthand writer should be present at the conference, and that the proceedings should be regarded as confidential, though no objection was taken to either party communicating the general tenor of the discussion to their respective councils.

The article referred to is, therefore, a breach of the agreement which was entered into at the conference. As negotiations are still proceeding as a result of the conference, it is too early to say whether they will be successful or otherwise, but this article is so prejudicial to the interest of the profession of massage for which we are working, that we feel it is essential to express our disapprobation of the course adopted without further delay.

We are, Sir, yours faithfully,

W. MILLIGAN, M.D., Chairman of the Executive Council

A. E. BARCLAY, M.D., Honorary Secretary.

71, King-street, Manchester, May 26th, 1917.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed.

Capt. W. G. Cummings, R.A.M.C., received his education at Queen's University, Belfast, and qualified in 1903. He was in practice at Hanwell, London, at the outbreak of war and joined the R.A.M.C. forthwith. He was a first-class Rugby player in his student days.

Lieut.-Col. W. B. Grandage, Royal Field Artillery, was engaged in the war as a combatant officer. He was educated at Cambridge and at St. Bartholomew's Hospital, qualifying in 1905, and held appointments at the Victoria Hospital for Children, at the Queen Charlotte Lying-in Hospital, and at St. Bartholomew's. He was a well-known Rugby football player and was engaged in practice in South Kensington prior to the war.

Drowned.

Capt. H. H. Robinson, D.S.O., R.A.M.C., was educated at Owens College, Manchester, and qualified in 1899. Before joining the R.A.M.C. he was in practice at Birkenhead, where he was honorary medical officer to the Children's Hospital. He was awarded the D.S.O. in August last year (see THE LANCET, Sept. 2nd, 1916, p. 450).

Died.

Captain R. F. Russell, R.A.M.C., qualified in 1905 at Aberdeen and practised at Methlick, Aberdeenshire, where he was medical officer and public vaccinator, and later joined the Jamaica Medical Service.

Missing, believed Drowned.

Capt. C. A. W. Pope, R.A.M.C., was educated at Cambridge and at St. Bartholomew's Hospital, London, and qualified in 1903. He had held appointments at the Somerset Hospital, Capetown, and at the South Devon and East Cornwall Hospital, and had been medical officer in charge of military families at Aldershot. He was in practice at St. Leonard's-on-Sea prior to joining the R.A.M.C.

Lieut. J. G. B. Smith, R.A.M.C., was a student at St. Bartholomew's Hospital and qualified in 1915.

Capt. A. Tilbury, R.A.M.C., was a student at Guy's Hospital and qualified in 1913. He was in practice in South London when war broke out and was given a commission in the R.A.M.C. He saw service in Egypt and returned to England later. He went down in the torpedoed s.s. *Transylvania*.

Previously reported Missing, now reported Killed.

Surgeon A. M. Russell, R.N., qualified at Glasgow in 1914, and joined the Navy soon afterwards.

Previously reported Wounded, now reported Died of Wounds.

Capt. R. H. Wilson, R.A.M.C., attached R.F.A., qualified at Belfast in 1915, and joined up soon afterwards.

Wounded.

Lieut. A. S. Carter, R.A.M.C., attached Worcester Regt.
Capt. J. C. Fergusson, R.A.M.C.
Lieut. J. W. Mackie, R.A.M.C., attached Northumberland Fusiliers.
Capt. H. N. Stafford, R.A.M.C.
Capt. J. F. Bourke, M.C., R.A.M.C., attached Scottish Rifles.
Capt. T. J. Gilmore, R.A.M.C., attached Gloucester Regt.
Capt. J. A. Gilfillan, R.A.M.C., attached Seaforths.
Lieut.-Col. J. J. Fraser, Canadian A.M.C.
Capt. W. W. J. Lawson, R.A.M.C.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Acting Capt. C. C. Codner, Somerset Light Infantry, younger son of Dr. J. Codner, of Corfe, near Taunton.
Lieut. B. O. Warner, Essex Regiment, youngest son of the late Dr. P. Warner, of Woodford Green, Essex.
Second Lieut. J. M. Dunwoody, Royal Dublin Fusiliers, only son of Dr. W. G. Dunwoody, of Ramsgate.

[The name of Capt. C. A. R. Gatley, R.A.M.C., should not have been included under this heading in our last issue, and we much regret the error. Capt. Gatley is wounded, and is at present in the Hall Walker Hospital for Officers at Regent's Park, London.]

THE HONOURS LIST.

The following awards to medical officers are announced :—

Bar to the Military Cross.

Temp. Capt. Reginald Peter Nutcombe Buckland Bluett, M.C., R.A.M.C., attached Highland Light Infantry.

For conspicuous gallantry and devotion to duty. He displayed great judgment and endurance in organising the stretcher-bearers in the attack. He worked continuously throughout the day, exposed for many hours to very heavy hostile fire.

(The award of the Military Cross was announced in THE LANCET of April 8th, 1916, p. 798.)

Military Cross.

Temp. Capt. Thomas Dowzer, R.A.M.C., attached Manchester Regiment.

For conspicuous gallantry and devotion to duty. He showed great personal bravery in moving about in the open under heavy fire, organising his bearers, and assisting in the search for the wounded.

Capt. Thomas Graham, R.A.M.C.

For conspicuous gallantry and devotion to duty. He rendered invaluable assistance in evacuating the wounded under very heavy fire. He has at all times set a splendid example of courage and determination.

Capt. Thomas Whittle Martin, R.A.M.C., Spec. Res., attached Royal Scots.

For conspicuous gallantry and devotion to duty. He was of the greatest assistance in organising the evacuation of the wounded across "No Man's Land" during the operation. He has on many previous occasions done fine work.

Temp. Capt. Francis Lorne McKinnon, R.A.M.C.

For conspicuous gallantry and devotion to duty. He personally led a search party up to the enemy wire in front of the village, under very close rifle and machine-gun fire. He succeeded in recovering two wounded men.

Temp. Capt. Charles O'Brien, R.A.M.C.

For conspicuous gallantry and devotion to duty. Although wounded, he insisted on remaining in command of the bearer division of his field ambulance, and in so doing materially expedited the removal of the wounded from the field.

Capt. Bertrand Cecil Owens Sheridan, R.A.M.C., Spec. Res., attached Worcester Regiment.

For conspicuous gallantry and devotion to duty. He tended the wounded continuously for 12 hours under very heavy fire. He set a splendid example of courage and determination throughout.

Capt. George Charles Willcocks, Australian A.M.C.

For conspicuous gallantry and devotion to duty. He worked continuously for about 16 hours in the open under heavy fire and successfully evacuated a large number of wounded men. He set a splendid example of courage and determination.

MENTIONED IN DESPATCHES.

In a despatch dated April 9th, 1917, received from Field-Marshal Sir Douglas Haig, G.C.B., Commander-in-Chief of the British Armies in France, the names of the following medical officers are mentioned:—

Royal Navy.—Temp. Surg. H. B. Padwick, D.S.O.
Royal Marines.—Temp. Surg. J. N. M. Ross, R.N.

Army Medical Service.

Headquarters Staff.

Lt.-Col. (temp. Col.) J. D. Alexander, R.A.M.C.
Capt. D. C. G. Ballingall, M.C., R.A.M.C.; Lt.-Col. (temp. Col.) H. P. W. Barrow, C.M.G., R.A.M.C.; Capt. J. J. H. Beckton, R.A.M.C.; Lt.-Col. (temp. Col.) W. C. Beevor, C.B., C.M.G., ret. pay; Lt.-Col. W. W. O. Beveridge, C.B., D.S.O.; Col. A. W. Bewley; Lt.-Col. (temp. Col.) R. J. Blackham, C.I.E., D.S.O., R.A.M.C.; Lt.-Col. W. R. Blackwell; Lt.-Col. (temp. Col.) B. W. Bliss, D.S.O., R.A.M.C.; Lt.-Col. (temp. Col.) A. W. N. Bowen, R.A.M.C.; Lt.-Col. (temp. Col.) G. W. Brazier-Creagh, C.M.G., ret. pay; Col. E. G. Browne, C.B.; Col. C. H. Burtchaell, C.M.G.
Col. H. Carr, C.B.; Capt. F. Casement, R.A.M.C.; Maj. H. St. M. Carter, D.S.O.; Lt.-Col. S. L. Cummins, C.M.G.
Capt. K. K. Drury, M.C.
Lt.-Col. and Bt.-Col. H. Ensor, D.S.O., R.A.M.C.
Lt.-Col. H. B. Fawcus, C.M.G.; Temp. Col. C. C. Fleming, D.S.O., ret. pay (Res. of Off.).
Col. J. J. Gerrard; Capt. A. J. Gibson; Lt.-Col. (actg. Col.) J. G. Gill, R.A.M.C.; Lt.-Col. (temp. Col.) J. Grech, D.S.O., R.A.M.C.; Lt.-Col. (temp. Col.) F. J. Greig, ret. pay (Res. of Off.).
Maj. J. A. Hartigan, D.S.O.; Lt.-Col. (actg. Col.) H. Herrick, R.A.M.C.; Temp. Capt. G. J. D. Hindley, R.A.M.C.; Lt.-Col. (temp. Col.) H. A. Hinge, C.M.G., R.A.M.C.; Lt.-Col. (temp. Col.) A. W. Hooper, C.M.G., D.S.O., R.A.M.C.
Col. (temp. Surg.-Gen.) J. M. Irwin.
Col. R. Jackson.
Col. E. Kirkpatrick, C.M.G.
Col. Sir W. B. Leishman, Kt., C.B., F.R.S.; Lt.-Col. L. N. Lloyd, C.M.G., D.S.O.; Maj. N. Low, D.S.O.
Capt. F. A. McCammon, M.C., R.A.M.C.; Surg.-Gen. W. G. Macpherson, C.B., C.M.G., K.H.P.; Temp. Capt. H. S. Marshall, R.A.M.C.; Maj. A. H. MacN. Mitchell; Lt.-Col. C. K. Morgan, C.M.G.
Col. D. M. O'Callaghan; Lt.-Col. (temp. Col.) S. de C. O'Grady Surg.-Gen. M. W. O'Keefe, C.B.
Capt. H. F. Panton, M.C.; Capt. G. S. Parkinson; Lt. (temp. Capt.) J. H. Pendered, R.A.M.C.; Col. (temp. Surg.-Gen.) W. W. Pike, C.M.G., D.S.O.; Lt.-Col. (temp. Col.) J. Poe, D.S.O., R.A.M.C.; Lt.-Col. (temp. Col.) C. H. Pollock, D.S.O., R.A.M.C.; Surg.-Gen. R. Porter, C.B.

Lt.-Col. (temp. Col.) M. McG. Rattray, R.A.M.C.; Maj. J. D. Richmond; Maj. M. B. H. Ritchie, D.S.O.; Col. J. J. Russell, C.B.

Surg.-Gen. R. H. S. Sawyer, C.M.G.; Lt.-Col. (temp. Col.) D. D. Shanahan, D.S.O., R.A.M.C.; Maj. G. F. Sheehan, R.A.M.C.; Col. (temp. Surg.-Gen.) B. M. Skinner, C.M.G., M.V.O.; Surg.-Gen. Sir A. T. Sloggett, K.C.B., C.M.G., K.H.S.; Maj. S. B. Smith; Lt.-Col. (temp. Col.) F. A. Symons, C.M.G., D.S.O., R.A.M.C.

Capt. G. P. Taylor, M.C.; Lt.-Col. (temp. Col.) H. S. Thurston, C.M.G., R.A.M.C.; Maj. J. A. Turnbull.

Col. S. Westcott, C.B., C.M.G.; Capt. H. F. Wilkins, M.C.; Surg.-Gen. T. P. Woodhouse, C.B.

Consultants.—Temp. Col. Sir J. R. Bradford, K.C.M.G., C.B., F.R.S. (Maj., 3rd Lond. Gen. Hosp.), R.A.M.C.; Temp. Col. F. M. Caird (Lt.-Col., 2nd Sco. Gen. Hosp.), R.A.M.C.; Temp. Col. Sir B. E. Dawson, K.C.V.O., C.B. (Capt., 2nd Lond. Gen. Hosp.), R.A.M.C.; Temp. Col. W. T. Lister, C.M.G.; Temp. Surg.-Gen. Sir G. H. Makins, K.C.M.G., C.B. (Lt.-Col., 2nd Lond. Gen. Hosp.), R.A.M.C.; Temp. Col. C. S. Wallace, C.M.G.

Royal Army Medical Corps.

Maj. (temp. Lt.-Col.) D. Ahern; Capt. F. J. Allen; Temp. Capt. T. E. Amyot; Temp. Capt. W. A. Anderson; Lt.-Col. S. A. Archer; Temp. Capt. B. W. Armstrong.

Temp. Capt. V. E. Badcock; Capt. R. P. Ballard, Spec. Res.; Temp. Capt. S. Batchelor; Temp. Capt. J. Biggam; Lt. E. S. Bissell (since relinquished his commn.); Temp. Capt. A. G. Bisset, Capt. (actg. Lt.-Col.) J. D. Bowie; Temp. Capt. J. C. Boyd; Temp. Capt. C. A. Brisco; Temp. Capt. D. S. Brough; Temp. Capt. W. T. Brown; Capt T. W. Browne; Temp. Capt. C. W. G. Bryan; Capt. C. F. Burton, Spec. Res.

Capt. (actg. Lt.-Col.) E. D. Caddell, M.C.; Capt. A. Campbell; Temp. Capt. F. Carson; Temp. Capt. H. Carson; Temp. Lt. G. E. Chissell; Temp. Capt. C. N. Coad; Temp. Capt. H. M. Cockcroft; Temp. Capt. R. C. Cooke; Capt. T. F. Corkill, Spec. Res.; Capt. N. A. Coward; Capt. E. M. Cowell; Temp. Capt. E. W. Craig; Capt. R. S. Cumming.

Temp. Capt. J. Davidson; Temp. Capt. C. F. Dillon-Kelly; Temp. Capt. C. O. Donovon, D.S.O.; Temp. Capt. C. G. Douglas, M.C.; Capt. W. J. Dowling, Spec. Res.; Temp. Capt. (actg. Lt.-Col.) R. E. Drake-Brockman; Maj. (temp. Lt.-Col.) B. H. V. Dunbar; Temp. Capt. J. J. Dwyer.

Temp. Capt. H. D. Eccles; Capt. P. W. Edwards, Spec. Res.; Temp. Maj. (temp. Lt.-Col.) W. B. Edwards; Temp. Capt. C. M. G. Elliott; Temp. Capt. J. H. Elliott; Lt. (temp. Capt.) R. Ellis; Lt.-Col. C. R. Evans, D.S.O.

Temp. Capt. C. C. Finlator; Capt. (actg. Lt.-Col.) W. H. Forsyth; Capt. (actg. Lt.-Col.) A. D. Fraser, M.C., Spec. Res.; Temp. Capt. S. J. C. Fraser.

Temp. Capt. H. B. Germau (late Surg., R.N.); Temp. Capt. R. S. Gibson; Lt.-Col. G. H. Goddard; Temp. Maj. (temp. Lt.-Col.) E. L. Gowlland; Temp. Capt. N. F. Graham; Temp. Capt. N. Grellier.

Temp. Lt. A. A. Halliday; Temp. Capt. J. D. Hart; Temp. Capt. W. S. B. Hay; Maj. (temp. Lt.-Col.) H. C. Hildreth; Maj. (temp. Lt.-Col.) A. B. Hinde, Res. of Off.; Maj. (temp. Lt.-Col.) G. J. Houghton; Temp. Capt. G. W. Huggins; Maj. (actg. Lt.-Col.) A. J. Hull; Temp. Capt. D. M. Hunter; Temp. Capt. A. H. Huycke.

Capt. C. Jacobs, Spec. Res.; Temp. Capt. G. W. B. James; Capt. D. W. John, Spec. Res.; Temp. Capt. D. S. Jones; Temp. Capt. D. W. F. Jones.

Maj. (temp. Lt.-Col.) W. D. C. Kelly; Temp. Capt. J. Kirton; Temp. Capt. J. St. P. Knight.

Temp. Capt. H. A. Lake; Temp. Capt. F. J. Lidderdale; Capt. (actg. Lt.-Col.) A. S. Littlejohns; Lt.-Col. D. D. Logan.

Capt. P. McCallum, Spec. Res.; Temp. Capt. W. H. R. McCarter; Temp. Capt. W. McCready; Temp. Capt. N. MacDonald (Lt. Can. A.M.C.); Capt. (actg. Lt.-Col.) D. F. Mackenzie, D.S.O.; Temp. Capt. J. W. McKinney; Temp. Capt. J. W. McLeod; Temp. Capt. M. T. McMahon; Lt. (temp. Capt.) D. N. Macleod; Temp. Capt. R. J. B. Madden; Capt. (actg. Lt.-Col.) R. Magill, Spec. Res.; Capt. H. W. Maltby, Spec. Res.; Capt. D. M. Marr, Spec. Res.; Temp. Capt. J. R. Marrack, M.C.; Lt.-Col. E. W. P. V. Marriott; Capt. R. P. S. Mason, Spec. Res.; Temp. Capt. H. C. D. Miller; Temp. Capt. W. Millerick; Capt. F. R. H. Mollan, Spec. Res.; Capt. (actg. Lt.-Col.) C. R. M. Morris; Temp. Capt. R. S. Morshead; Temp. Capt. (actg. Lt.-Col.) F. F. Muecke; Capt. (actg. Lt.-Col.) K. D. Murchison, Spec. Res.; Capt. W. F. Munro.

Temp. Capt. K. M. Nelson; Capt. T. S. Nelson, Spec. Res.

Temp. Capt. H. B. Owens.

Temp. Capt. W. H. Parry; Capt. Owen G. Parry-Jones, Spec. Res. (died of wounds); Maj. J. S. Pascoe; Temp. Capt. M. P. Paton; Temp. Capt. D. H. Pennant, D.S.O.; Temp. Capt. S. S. Picken; Capt. L. T. Poole; Temp. Capt. J. H. Porter; Maj. (temp. Lt.-Col.) J. E. Powell; Temp. Capt. K. Pretty.

Maj. (temp. Lt.-Col.) J. Rahilly; Temp. Capt. M. Ramsay; Capt. A. Ramsbottom, Spec. Res.; Temp. Capt. G. A. Renwick; Temp. Lt.-Col. R. H. M. Roberts, C.M.G., T.D.; Temp. Capt. J. F. Robertson; Capt. (actg. Lt.-Col.) R. T. C. Robertson, Spec. Res.; Maj. (temp. Lt.-Col.) H. Rogers; Temp. Capt. W. Rogerson; Capt. J. C. Rowe; Temp. Capt. H. B. G. Russell; Temp. Capt. W. Russell; Capt. A. A. Rutherford.

Temp. Capt. A. P. Saint; Capt. J. A. C. Scott, M.C.; Capt. T. G. Shand; Temp. Capt. A. D. Sharp; Temp. Capt. T. Sheehan; Maj. (temp. Lt.-Col.) W. M. B. Sparkes, D.S.O.; Temp. Capt. G. R. Spence; Capt. A. H. Spicer; Maj. (temp. Lt.-Col.) H. Stewart, M.C.; Temp. Capt. A. V. Stocks.

Capt. (actg. Lt.-Col.) M. R. Taylor (late Capt. A. Med. Res.); Maj. (temp. Lt.-Col.) R. J. C. Thompson, D.S.O.; Temp. Capt. R. Tindall; Temp. Capt. R. W. L. Todd; Temp. Capt. W. A. Troup.

Capt. G. T. Van Der Vyver, Spec. Res.

Temp. Lt. K. M. Walker; Temp. Capt. R. B. Wallace; Lt.-Col. A. H. Waring; Capt. W. J. Webster, Spec. Res.; Capt. (actg. Lt.-Col.) A. G. Wells; Temp. Capt. G. R. C. Wilson; Temp. Capt. J. A. Wilson; Capt. C. S. E. Wright; Maj. (temp. Lt.-Col.) T. J. Wright.

Temp. Capt. H. Young; Capt. S. K. Young, Spec. Res.

Capt. W. W. Adamson; Capt. (temp. Maj.) E. Alderson; Capt. G. N. Anderson; Maj. (temp. Lt.-Col.) R. Coffey; Temp. Capt. J. Crawford, M.C.; Maj. (temp. Lt.-Col.) J. F. Crombie; Capt. (actg. Lt.-Col.) H. K. Dawson; Capt. A. M. Deane; Capt. A. E. Delgado; Capt. S. E. O. Dudfield; Capt. H. Foxton; Lt.-Col. T. Fraser; Maj. G. E. Gask; Capt. A. F. Girvan; Capt. J. Golding; Maj. J. M. Gover; Capt. C. K. Gozney; Capt. J. M. Hamill; Maj. (temp. Lt.-Col.) G. H. L. Hammerton; Capt. W. H. P. Hey; Lt.-Col. F. W. Higgs; Lt.-Col. C. H. Howkins; Capt. A. M. Hughes; Lt.-Col. W. H. Hume; Maj. (temp. Lt.-Col.) T. Kay; Temp. Capt. J. Kirker; Capt. H. W. Lance; Capt. H. Lightstone, M.C.; Maj. (temp. Lt.-Col.) C. H. Lindsay, C.M.G.; Capt. H. E. McCready; Capt. (actg. Lt.-Col.) G. Mackie; Capt. E. R. Matthews; Capt. G. L. Matthews; Capt. W. T. P. Meade-King; Capt. E. J. Messent; Maj. W. B. Millbanke; Maj. G. W. B. Miller,; Capt. B. B. Morgan; Capt. J. A. Nixon; Maj. (temp. Lt.-Col.) T. P. Puddicombe; Capt. A. E. Rayner; Capt. D. G. Rice-Oxley; Maj. (temp. Lt.-Col.) D. Rorie; Capt. W. C. Stewart; Capt. (temp. Maj.) R. S. Taylor; Capt. A. P. Thomson; Capt. H. Vickers; Capt. J. S. Wallace; Maj. (temp. Lt.-Col.) R. M. West; Capt. L. T. Whelan; Capt. (actg. Lt.-Col.) A. J. Williamson; Lt.-Col. E. A. Wraith.

FOREIGN DECORATIONS.

Italian.

Order of St. Maurice and St. Lazarus: Cavalier.—Lt.-Col. W. W. Hearne, Australian A.M.C.

Order of the Crown of Italy: Commander.—Surg.-Gen. W. G. Macpherson, C.B., C.M.G., K.H.P.

Silver Medal for Military Valour.—Capt. H. H. Burnham, Canadian A.M.C.; Temp. Capt. H. N. M. Puckle, R.A.M.C.; Temp. Capt. M. Scott, R.A.M.C.; Temp. Capt. C. McM. Wilson, M.C., R.A.M.C.

THE SUPPLY OF MEDICAL OFFICERS FOR THE ARMY: POSSIBLE AMERICAN ASSISTANCE.

The Central Medical War Committee has been working steadily and at great pressure to meet the demands of the War Office for medical officers for the Army, and the position indicated in these columns some time ago as imminent has clearly been reached. In existing circumstances all the War Office demands cannot be met. The information that a large number of American medical men will shortly be available for service in France has been considered by many to promise an amelioration of the situation, but there is as yet no definite and official warrant for believing that the problem of an adequate supply of medical officers for the British Army will be solved in this way. Undoubtedly there are American medical men promptly available to serve for the time being with our Army or with the French Army, and probably more of the same gallant assistance will be forthcoming. Recognition of the qualifications of these American confrères by their Medical Association or statutory Colleges would enable them to be at once available for the armies at the Allied fronts. But these American doctors would probably have to be returned to the American Army when expeditionary forces begin to arrive from the United States. A temporary respite from acute trouble, however, might be gained through the employment of American doctors, and such respite would be valuable to this country where the supply of medical men has become so dangerously short. The subject is now under the discussion of the Central Medical War Committee. No one who is aware of the circumstances in which exemption is refused or obtained by our medical men of military condition can possibly suggest that the Central Medical War Committee takes other than a very high view of its responsibilities towards the Army. It has, however, an enormously important duty towards the civilian population in this country, and cannot be blind to it. So closely have the areas in England been scrutinised with a view to obtaining every medical officer for the Army, so intensive is the method of investigation and reinvestigation now being conducted, that it seems certain that should all this energy and self-sacrifice not bear sufficient fruit the Army will have to economise in the employment of medical men under some plan of redistribution or reorganisation. There are already men being sent into the Army who can badly be spared by the State.

HAMPSTEAD MEDICAL WAR COMMITTEE.

Having regard to the fact that medical men who have relinquished their commissions in the Army are now returning to practise, the following resolution was recently passed by the Committee:—

This Committee is of opinion that there should be no receding from the terms of the undertakings issued by this or other Medical War Committees. No request from returning doctors should absolve the members of the profession from their obligations incurred by the undertakings.

The resolution was occasioned on account of the apparent disloyalty of some members of the public towards the men who have sacrificed so much by accepting commissions, although over military age. If the members of the profession are loyal to their undertakings it is hoped that the laity will learn from them.

The undertaking referred to is one which was almost universally signed and agreed to in November, 1915, and will be remembered by all our readers.

AN IMPERIAL MEDICAL AND NURSING SCHEME.

Sir J. Kingston Fowler, late consulting physician to the Army in France, has issued through Messrs. Macmillan and Co., in the form of a pamphlet, a scheme for the organisation of the medical and nursing professions of the Empire for war, in the hope that it may serve to stimulate imagination and thought and foster *esprit de corps*. Beginning with a tribute of praise to the splendid work of the Royal Army Medical Corps, both Regular and Territorial, during the war, and to the foresight and ability of Sir Alfred Keogh, K.C.B., who organised the medical services of the Territorial Force, thus enabling the country to provide fully equipped hospitals ready to receive patients before the wounded arrived from France, he says, "this should not lead us to think that perfection has been attained ..... and every effort should be made to ensure that the experience now in many minds is not lost after the war is over, but is utilised for our future advantage." After describing the medical service of the old Volunteer Force, which had many defects, and the existing system under the Territorial Force, he outlines the proposed scheme which is to utilise the sentiment of attachment to the medical schools as a factor in the organisation of the medical profession for war.

Any scheme of the kind must fulfil certain conditions: It must be independent of the form of military service, whether voluntary or compulsory, or territorial; it must be flexible and capable of unlimited expansion; it should be applicable to the whole Empire; it must recognise that allegiance to an Alma Mater may by long association with another institution be transferred; it must provide for men who have no such allegiance; it must have regard to those universities which only make provision for the preliminary and intermediate subjects of a medical education; it must recognise that in the Scotch universities the number of graduates is so large that the sentimental attachment is, as regards some of them, possibly weaker than obtains in the London schools; provision must be made for the inclusion of general hospitals situated in large towns in which there is no medical school, as in regard to these hospitals there is a strong feeling of attachment amongst the medical men of the town and county; the names given to the hospital units must be reminiscent of their origin and of Home. While it is true that the mention of a number may be a powerful aid to the imagination, as witness the numbers of many regiments, in relation to hospital units numbers are weak. The regiment never dies; its traditions are quickly learned by the recruit, but the hospital units are formed *ad hoc*, and after a war is over they disappear, and any *esprit de corps* that may have been evoked is lost and forgotten.

The proposal is to name the hospitals after the school, college, university, or town from which the personnel has been drawn, and which in each case forms the bond uniting the individual members of the staff to one another. For example, such names as No. 1 London General Hospital, R.A.M.C. (T.), No. 1 Northern General Hospital, R.A.M.C. (T.), and all the others so named would disappear from the Army List and would be replaced by No. 1 Oxford University, No. 1 Cambridge University, No. 1 Edinburgh University, No. 1 St. Bartholomew's Hospital. The permanent staff of a centre would consist of the commanding officer, the adjutant, the quartermaster, and a certain number of orderlies. The duties of the commanding officer and adjutant in time of peace would be—

To receive all communications from the War Office and to carry the regulations into effect; to keep the mobilisation roll; to receive applications for admission to the roll, and to accept or refuse them; to classify the applicants according to their attainments and record of work; to recommend officers for commissions in the units under their control; to keep up the personnel of at least one complete general hospital, and usually of two or more such hospitals—of these No. 1 would be for service in this country; No. 2 possibly for service abroad;—to carry out the regulations as to the training of the orderlies; to receive the order "Mobilise," and to carry it into effect; in time of war to maintain the personnel of their units and to provide drafts for the units of the fighting line as required by the War Office. The number of names on any roll would necessarily be far greater than would be required to maintain the personnel of the units for which the centre was responsible.

The personnel of No. 1 Hospital of any centre would consist of seniors—i.e., physicians, surgeons, officers in charge of special departments—who would serve in the military hospital at home. No officers liable for general service abroad in time of war should be appointed to No. 1 Hospital of any centre. The staff of No. 2 would consist of younger members of the honorary staff, with a similar complete personnel necessary for a general hospital abroad. Similarly with No. 3, and so on. Each hospital, whether serving abroad or at home, should be provided with a fully equipped bacteriological laboratory which is essential in the interest of the patients. Probably in many cases the institution or town responsible for the units would provide, as a gift, the laboratory and X ray outfit.

Among the advantages claimed for the scheme are its applicability to the whole Empire and its elasticity. The organisation of the nursing profession would follow broadly on the lines already suggested for the medical profession.

THE TREATMENT OF THE WAR CRIPPLE.

The statement by the Minister of Pensions, on which we commented last week, has now been supplemented by a very welcome circular addressed by the President of the Local Government Board to boards of guardians in regard to discharged disabled soldiers and sailors detained in Poor-law institutions. Under the terms of the new Royal Warrant any disabled man who is in receipt of a pension and has been recommended for special treatment in a sanatorium or other institution is entitled to an allowance of not less than 27*s.* 6*d.* a week for himself and an appropriate allowance for his wife and children, the local War Pensions Committees being charged with the duty of making the requisite arrangements for the institutional treatment of men residing within their area. In view of these provisions, the circular states, no discharged disabled man should in future be under the necessity of seeking Poor-law relief in a workhouse or infirmary in any case where the incapacity from which he is suffering is due to his disablement. The guardians are asked to communicate with the local War Pensions Committee of their area in regard to any such cases at present in institutions under their control. Future applications from discharged men should be referred at once to the local War Pensions Committee. The proposed surrender of the functions of the Statutory Pensions Committee to the Ministry of Pensions should serve still further to unify procedure.

THE UNITED STATES AND MEDICAL ORGANISATION FOR THE WAR.

The Sanitary Service in the Field.—In the field, according to the *Journal of the American Medical Association*, the sanitary service of the United States Army is divided into two sections—for the zone of advance and the line of communications. In the first zone the mobile sanitary units are located, the second being specially concerned with supply and the evacuation of sick and wounded. The general arrangements are similar to those in the large European armies. With each division there are four ambulance companies under a director, each company consisting of 5 medical officers and 79 enlisted men, with 12 ambulances and 3 wagons for the transport of supplies. On going into action immediate first-aid is performed by the sanitary detachments belonging to each regiment. Dressing stations are established at various parts of the field as required on the notification of the divisional surgeon, from which the wounded are removed to field hospitals in the rear. Four field hospital units are attached to a division under the control of a director of field hospitals, each to accommodate 216 patients, and with a personnel of six medical officers and 67 enlisted men. Where existing buildings are not available tents are to be erected. The field hospitals themselves can be evacuated as quickly as possible and the wounded removed to hospitals further in the rear. It is here that the Red Cross organisation comes into play. A motor transport is now being organised. The medical service on the lines of communication, which may nowadays be anything from 50 to 300 miles, is in charge of a surgeon stationed at the base, with a second to supervise the evacuation of the wounded from the time of leaving the field hospital until reaching the hospital train for the base. To prevent congestion on the railways bringing up supplies, two evacuation hospitals at the head of the line of communication are allotted to each division, each with a personnel of 14 officers and 153 enlisted men. These hospitals have a normal capacity of 432 beds, with sufficient supplies on hand to provide for sudden expansion. In the same hospitals complete treatment is provided for those who cannot be removed further owing to the serious nature of their wounds, and for those who will recover completely within a week or ten days. Evacuation from the line-head to base will eventually be carried out by fully-equipped hospital trains, providing the same care as a permanent hospital. Only one such train is at present ready for use. Base hospitals will have a capacity of 500 beds each with a personnel of 20 officers, 153 men, and 46 female nurses, but will be able to provide double accommodation at short notice. A convalescent camp is connected with each base hospital.

OBITUARY OF THE WAR.

FRANK ALBERT SYMONS, C.M.G., D.S.O., M.B. EDIN.,

TEMPORARY COLONEL, ROYAL ARMY MEDICAL CORPS.

Colonel F. A. Symons, who was killed on April 30th, was son of the late John Hughes Symons, of Nova Scotia, and received his medical education at Edinburgh University, qualifying M.B., C.M. in 1891. On the outbreak of the present war he was one of the first to leave England in command of a clearing hospital with the rank of lieutenant-colonel, and he had been abroad ever since. In November, 1915, he became temporary colonel and later Assistant Director of Medical Services. He was twice mentioned in Lord French's despatches, received the D.S.O. in the first honours list of the war, and was made a C.M.G. in the New Year honours list of the present year. He served in the South African War, where he was military secretary to the late Sir William Mac Cormac, with whom he was present at the battle of Colenso and the relief of Ladysmith.



"Colonel Symons was a splendid organiser and indefatigable worker," his Divisional General writes, "and these qualities, together with his cheery, tactful manner, won for him the affectionate regard of officers and men." Another writes of him as a valued senior medical officer, whose judgment in difficult situations was sound and practical.

Colonel Symons married in 1900 Dorothy, second daughter of the late Edmund Grove Bennett, of The Close, Salisbury, and leaves a widow and four children.

JAMES ELLIOT BLACK, M.B., CH.B. GLASG.,

MILITARY CROSS;
CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain J. E. Black, who was recently killed on active service in France, was the son of the late Adam Elliot Black, of Glasgow. He was educated at Cargillfield and Fettes College, graduating in medicine at Glasgow University in 1911. When war broke out he was studying for his D.P.H. Cambridge, but immediately volunteered for service, leaving in October, 1914, for France, where he was attached to a clearing hospital. He was one of the first medical officers to deal with drift-gas poisoning, and the results of observations on 685 such cases by himself and others were embodied in a paper published in the *British Medical Journal* of July 31st, 1915. In April, 1915, he was promoted to the rank of captain, and in January of the following year his name was mentioned in despatches. Later he became attached to the 8th Bedfordshire Regiment. His award of the Military Cross was recorded in THE LANCET of Nov. 18th last year for conspicuous gallantry and devotion to duty in the field. "He rendered valuable services when attending the wounded under heavy machine gun and shell fire. Later, he went out into 'No Man's Land' to succour the wounded." One of his fellow-workers in the pathological institute of the London Hospital, where he acted as assistant in 1912, writes: "An indefatigable worker in spite of poor health, gentle and kindly, always ready to help, modest to a degree which made him ignorant of his exceptional ability and of the value of his work, Captain Black had a personal charm which endeared him to all his colleagues."



ROBERT HOME, M.B., C.M. TOR.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain R. Home, who was recently reported killed on active service, was born in Toronto in 1890, graduating at his home University in 1913. Entering the Canadian Army Medical Corps, he served at the Military Hospital at the Exhibition Camp, Toronto, transferring to the Royal Army Medical Corps in November, 1915; at first with the 107th Field Ambulance, he was later medical officer of the 14th Gloucesters.

JOHN MARSHALL, M.B., CH.B. EDIN.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant J. Marshall, who was reported missing, believed drowned, on April 15th, was 30 years of age and eldest son of the late Alderman R. Marshall, J.P., of Berwick-on-Tweed. From Berwick Grammar School, where he was Johnston scholar and prizeman, he entered Edinburgh University, graduating M.B. Ch.B. in 1908 with first-class honours and the award of the McCosh travelling scholarship. After studying in Paris and Munich he was appointed house surgeon at Greenbank Hospital, Darlington, where he remained two years, leaving to become assistant to Dr. P. F. Mannix, of Lancaster. Latterly he had been resident at the Beaufort War Hospital, Bristol, until February of the present year, when he obtained a commission in the Royal Army Medical Corps. One of his intimates writes of him as a most unselfish man, respected and beloved by his patients, particularly by the poor.



GUY BROOKE BAILEY, M.B., B.S. MELB.,

CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain G. B. Bailey, who was killed in the recent fighting in France, was 34 years of age at the time of his death and a medical graduate of Melbourne University. During his University career he took a prominent part in athletics, representing Trinity College in cricket and rowing. He was practising in Hobart, Tasmania, prior to joining the Australian Imperial Force. He leaves a widow and one child.

CLIVE BRITTEN BURDEN, M.B., CH.B. ADEL.,

CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain C. B. Burden, who died on May 8th, aged 25 years, from injuries accidentally received, was the son of J. B. Burden, of Adelaide. He recently graduated in medicine at Adelaide University, where he was popular with his fellow students for his genial disposition and his skill in athletic sports. Joining the Australian Imperial Force in July last, he came over as a general reinforcement officer early in the present year, and later saw service in France. His loss is felt by brother officers here and by his many University friends in Australia.

ANOTHER HOSPITAL SHIP TORPEDOED.—On May 26th, at 6 P.M., the hospital ship *Dover Castle* was struck by a torpedo without warning in the Mediterranean and was sunk two hours later as the result of a second torpedo. All the patients and hospital staff were saved, as well as the whole crew with the exception of six men who were injured by the explosion.

GIFTS TO THE RED CROSS SOCIETY.—The Joint Finance Committee of the British Red Cross Society and the Order of St. John has received £5000, the result of an appeal made on behalf of the sick and wounded of the British armies by the Imperial Red Cross Committee of Newfoundland.

As a result of the Red Cross Sale held by Messrs. Christie in March and April last, £84,157 have been received by the British Red Society and the Order of St. John. The sale in 1915 produced £38,215, and that in 1916 £52,691.

WAR HOSPITAL MAGAZINES.—The May issues of the *Craigleith Hospital Chronicle* (Craigleith, Edinburgh, 6*d*.), the *Gazette of the 3rd London General Hospital* (Wandsworth, 4*d*.), and the *War Hospital Magazine* (Huddersfield, 3*d*.), maintain their standard, both in letterpress and illustration, making an appeal to the inmates and staffs of the hospitals they represent, as well as to the general public. The same may be said of the April issue of the *Ration* (Reading, 2*d*.). The profits on all these magazines are devoted to the provision of extra comforts for the hospital inmates, and we note with regret that, owing to the scarcity of paper, among other things, the *Craigleith Hospital Chronicle*, one of the earliest and best of this class of periodicals, will disappear as a monthly with the next issue. An occasional number may be issued from time to time.

A NAVAL FLEET-SURGEON'S IMPRESSIONS IN THE TRENCHES.—In order to strengthen the sympathetic bond between the sister services the Admiralty and War Office made arrangements in 1916 to send a certain number of naval officers to gain experience of trench life and a corresponding number of army officers to experience life afloat under war conditions. Fleet-Surgeon C. Marsh Beadnell, R.N., was one of the privileged officers of the Navy to visit the trenches, and the interesting account of his impressions, which was published in the January and April issues of the *Journal of the Royal Naval Medical Service*, has now been reprinted in the form of a pamphlet and published by Messrs. John Bale, Sons, and Danielsson, Great Titchfield-street, W. Naturally, the six days which the author spent in the trenches afforded only a glimpse of real trench life, but his observational powers enabled him to take in every detail which that glimpse afforded, and a useful as well as an interesting description with many humorous touches is the result. There is a description of the medical arrangements and an account of gas attacks, the routine to cope with this offensive, and the effects of the gas on man, animals, and vegetation. The itinerary includes a visit on foot to the firing trenches, a trip down the sap, and below No Man's Land.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—The following candidates have passed in the subjects indicated:—

Surgery.—W. A. Bibby, Manchester; H. N. Dale-Richards (Sect. I.), St. Mary's Hospital; E. F. Deacon (Sect. I.), Guy's Hospital; J. Y. Dent (Sects. I. and II.), King's College Hospital; S. G. K. Kastelianski (Sect. II.), London Hospital; R. H. Pettersson (Sects. I. and II.), St. George's Hospital; G. W. Pratt (Sects. I. and II.), Cambridge; and F. A. Unwin (Sect. II.), Westminster Hospital.

Medicine.—E. A. Leak (Sect. I.), Cambridge and London Hospital; R. H. Pettersson (Sect. II.), St. George's Hospital; and L. J. Vincent (Sects. I. and II.), Cambridge and St. Mary's Hospital.

Forensic Medicine.—E. F. Deacon, Guy's Hospital; E. W. Diggett, Jefferson College, Philadelphia; L. E. Lewis, Glasgow; and D. Menzies, St. Mary's Hospital.

Midwifery.—G. S. Ashby, King's College Hospital; E. F. Deacon, Guy's Hospital; and M. Ibrahim, Middlesex Hospital.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery:—J. Y. Dent, S. G. K. Kastelianski, R. H. Pettersson, F. A. Unwin, and L. J. Vincent.

THE LATE MR. W. LE PAGE.—The death occurred on May 13th, at his residence in Guernsey, of William Le Page, L.R.C.P. Edin., L.F.P.S.Glasg., and L.M., aged 75, who was well known in the island. He was the son of Mr. Le Page and Amelia de Jersey and studied medicine at Durham University. He qualified by taking the triple qualification of Edinburgh and Glasgow. He had been a surgeon-lieutenant-colonel in the Royal Guernsey Militia, surgeon to St. Peter Port Hospital, surgeon to the Castel Hospital, and physician to the Castel Lunatic Asylum. He leaves a widow to mourn her loss.

LITERARY INTELLIGENCE.—Messrs. J. and A. Churchill announce the forthcoming appearance of a book entitled "Massage, its Principles and Practice," containing original photographic illustrations, by Dr. J. B. Mennell, physician to the Military Orthopædic Hospital, Shepherd's Bush, and one on "Surgical Nursing and After-treatment," containing over 100 illustrations, by Dr. H. C. R. Darling, assistant surgeon to South Sydney Hospital.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.—The annual meeting of this association will take place on July 25th, at 11, Chandos-street, Cavendish-square, London, W. The meeting, as in 1915 and 1916, will be held on one day only. In accordance with a by-law of the society, Dr. R. H. Steen, the acting honorary general secretary, requests the contribution of papers and other scientific matter. Dr. Steen may be addressed at the City of London Mental Hospital, Dartford, Kent.

THE annual general meeting of the Röntgen Society will be held on Tuesday, June 5th, at 8.15 P.M., at the Cancer Hospital (Free), Fulham-road, S.W. The adjourned discussion on the Future of the British X Ray Industry, will be opened by Captain R. Knox. Lieutenant-Colonel Robert Wilson, C.A.M.C., Mr. J. H. Webb, and Mr. Howard C. Head are expected to take part.

THE LATE MR. PETER MACEWAN, F.C.S.—We regret to learn the sudden death last week of Mr. Peter MacEwan, the editor of the *Chemist and Druggist*. His literary contributions to scientific pharmacy were numerous and valuable, and his knowledge of all the legal enactments dealing with his profession was intimate.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee, held on May 8th, 25 cases were considered, and £213 granted to 21 of the applicants. The following is a summary of some of the cases relieved:—

Wife, aged 56, of M.R.C.S. Eng. who practised at New Zealand and Hoxton. Applicant's husband has been paralysed for 28 years, and the little income he has is insufficient to support them. The wife prior to the war was able to earn as a teacher of music and languages, but cannot obtain pupils at present; and their only son, who used to help, has recently joined the Army and married. Voted £15 and referred to the Guild.—M.R.C.S. Eng., aged 74, married, who practised at Darlington and Malvern. Owing to ill-health and insufficient means, and the increased cost of living, unable to pay his way. His wife has recently broken her leg. Only income about £100 a year from son and friends. Rent £25. Voted £18 in 12 instalments.—Widow, aged 67, of M.R.C.S. Eng. who practised at Leighton Buzzard, and died in 1904. Applicant lost the small capital she had through fraudulent executors. Only income now 11*s*. per week provided by relatives. Pays 5*s*. 6*d*. per week rent; and high price of food makes it impossible for her to manage. Voted £12 in 12 instalments.—Widow, aged 46, of M.R.C.S. Eng. who practised at Brixton, and was an annuitant of the fund. Applicant left without means, and health very much impaired by the constant nursing, for the last eight years, of her husband, who was a chronic invalid. She hopes, after a rest, to find suitable employment, and then manage to earn a living. Voted £5. Widow, aged 58, of L.R.C.P. Edin. who practised at Blackburn, and died in 1902. Applicant was left unprovided for with a young daughter, now aged 19. Both have recently obtained work through the help of the Manchester branch of the Guild, and the prospects are brighter than they have been before, but they still require a little help to get their affairs straight, owing to their previous strenuous times. Relieved four times, £40. Voted £5.—Widow, aged 73, of M.R.C.S. Eng. who practised at Liverpool and died in 1887. Applicant kept house for her son, a medical man, who died in 1915 after a very strenuous time on war work. Applicant lives in own house, but it is heavily mortgaged. Takes in paying guests, but does not make sufficient to meet her liabilities. Relieved once, £10. Voted £10.—Widow, aged 41, of M.D. Glasg. who practised in London and died in 1910. Left entirely without means and has defective eyesight. In the summer months she earns 15*s*. a week as an attendant. In the winter months only has casual employment. Health has been very indifferent lately. Relieved twice, £20. Voted £10 in two instalments.—Daughter, aged 62, of L.S.A. Lond. who practised at Cheadle and died in 1874. Owing to ill-health and advancing years, unable to undertake permanent work. Friends allow her £25 a year. She earns about £5 by sewing. Relieved 11 times, £100. Voted £15 in 12 instalments.—Widow, aged 45, of L.S.A. Lond. who practised at Swansea and died in 1915. Was left entirely without means with three children. The eldest was taken by a relative, and the daughter, now aged 17, is being educated by the Guild. Applicant has had post as working housekeeper, but has recently had to give this up. Relieved once, two years ago. Voted £10 in two instalments.—Wife, aged 50, of M.R.C.S. Eng. who practised at Bournemouth. She and her daughter were deserted by her husband some years ago, being left entirely without means. The applicant is a chronic invalid, and the daughter is only able to earn a little by casual employment. Relieved four times, £38. Voted £12 in 12 instalments.—Widow, aged 63, of L.R.F.P.S. Glasg. who practised at Irvine and died in 1899. Applicant left without means, and she suffers from chronic rheumatism and sciatica. Manages to earn a little by letting rooms, but not sufficient to live on. Relieved three times, £36. Voted £12 in 12 instalments.—Daughter, aged 58, of L.S.A. Lond. who practised at Bow and Forest Gate. Applicant has to look after invalid father, who is an annuitant of the Fund, and owing to the high price of food finds it difficult to manage. Relieved once, £10. Voted £10 in two instalments.—Daughter, aged 41, of L.S.A. Lond. who practised at Bermondsey and died in 1887. Applicant's mother, who has just died, had

recently been helped by the Fund. The Guild propose training applicant as a shorthand typist, and placing her in a position to earn her own living. Voted £5.—Daughter, aged 51, of F.R.C.S. Eng. who practised at Biggleswade, and died in 1890. Applicant is a chronic invalid and unable to undertake any permanent work. Relieved 18 times, £165. Voted £12 in 12 instalments.—Daughter, aged 51, of M.R.C.S. Eng. who practised at Peckham and died in 1885. Applicant suffers from neuritis and defective eyesight and was only able to earn £2 last year. Only other income £20 from sister. Relieved 19 times, £221. Voted £15 in 12 instalments.—Daughter, aged 57, of M.R.C.S. Eng. who practised in London and other places and died when applicant was a child. For many years applicant had a very strenuous time, and last year commenced as a munition worker and was doing well, but was unfortunately knocked down by a 'bus in December last and was in the infirmary for almost four months. Is now staying with relations, who are unable to keep her. She hopes to get some compensation. Relieved twice, £10. Voted £12 in 12 instalments.

Subscriptions may be sent to the acting honorary treasurer, Dr. Samuel West, at 11, Chandos-street, Cavendish-square, London, W. 1.

Mr. V. Warren Low, C.B., M.D., F.R.C.S., has been appointed External Examiner in Surgery to the London University.

THE death is announced of Dr. J. Mitford Atkinson, for many years superintendent of the Government Civil Hospital at Hong-Kong.

THE DALRYMPLE INEBRIATE HOME.—The report of the Homes for Inebriates Association for the year ending Jan. 31st, 1917, includes the report for that year of Mr. F. S. D. Hogg, the medical superintendent of Dalrymple House, Rickmansworth. Mr. Hogg makes the interesting comment, in noting that readmissions have during the year been unusually numerous, that this has been due to good but ill-timed intentions on the part of the patients. "Men," he says, "have been over-anxious to obtain admission into the Army or Navy, or to return to a business or profession which is being neglected owing to scarcity of staff or substitutes, or they have been hit by the war and cannot afford to be away from their work. Whatever the reason, the period of treatment is curtailed, and a strenuous life has to be faced by one who is not yet fit to undertake such duties and who has not yet sufficiently recovered from the effects of alcohol or drug addiction."

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Venereal Disease Act.

THE Venereal Disease Act, 1917, has received the Royal Assent.

Whitsuntide Recess.

Parliament has adjourned for the Whitsuntide Recess.

HOUSE OF COMMONS.

WEDNESDAY, MAY 23RD.

Medical Re-examinations.

Mr. HOGGE asked the Under Secretary for War whether a discharged man recalled for examination under the Military Service (Review of Exceptions) Act could insist upon the Medical Board producing his medical history.—Mr. MACPHERSON replied: The answer is in the negative.

Epileptics and the Army.

Mr. HOGGE asked the Under Secretary for War whether there was an Army Order which forbade the discharge of epileptics from the Army.—Mr. MACPHERSON answered: The instructions issued on Dec. 9th on this point lay down that a soldier suffering from epilepsy will not be discharged on that ground alone unless his incapacity is such as to unfit him for any military employment suitable to C 3 men. He will be re-classified in a category from which men are eligible for transfer to Class P or P (T) of the Reserve.

THURSDAY, MAY 24TH.

Fees of R.A.M.C. Officers.

Sir G. TOULMIN asked the Financial Secretary to the War Office whether a captain in the Royal Army Medical Corps serving in a military hospital was entitled to charge a fee for filling up a statement required by a life association in reference to a man who had died under his charge.—Mr. H. FORSTER wrote in reply: I am not aware why any fee ordinarily payable by a life association should not be charged.

FRIDAY, MAY 25TH.

Medical Re-examinations.

Mr. NEEDHAM asked the Under Secretary for War what procedure was open to a man called up for examination under the Military Service (Review of Exceptions) Act, 1917, who was dissatisfied with his medical classification, to have his case submitted to a Medical Appeal Board.—Mr. MACPHERSON replied: An application to be examined by a special Medical Board is submitted for the consideration of the War Office by the military representative in a case where such examination is recommended by a military service tribunal before which the man concerned has laid his case.

Mr. PRINGLE: Are we to understand that he cannot get an appeal to a special Medical Board except through a tribunal?—Mr. MACPHERSON: That is so.

Replying to Mr. NEEDHAM, Mr. MACPHERSON said: The special Recruiting Medical Board at Leeds deals with cases of disputed medical classification of men resident in the North of England which tribunals recommend should be sent to an Appeal Board. The recommendations of the tribunals are submitted to the War Office along with the necessary documents in each case. Men sent to the special Medical Board for examination are provided with travelling warrants and with subsistence if detained overnight.

Answering Mr. T. TAYLOR, who asked whether examinations of recruits by the Medical Boards had frequently been made at the rate of 30 per hour, Mr MACPHERSON said that he was not aware of any instance in which recruits had been examined at the rate mentioned. Express instructions had been issued that examinations under the Military Service (Review of Exceptions) Act should be most careful. The classification certificate was signed by the president of the board.

In the course of the debate on the adjournment motion, Mr. MACPHERSON said that members of Medical Boards were just as sympathetic to men called up for examination under the Military Service (Review of Exceptions) Act as any Members of the House of Commons. At least 75 per cent. of the members of the Medical Boards were civilian practitioners. It was the invariable practice that two of every three doctors on those boards were civilians, and if it were true—and he thought it was true—that there was a proportion of two-thirds of three members of the board civilian, then to say that two-thirds was dominated by the remaining third passed his comprehension.

Cromarty Camp Hospital Huts.

Mr. ANDERSON asked the Under Secretary for War whether 25 of the huts in the Cromarty Military Camp were being used for cases of venereal disease.—Mr. MACPHERSON replied: No, sir. The scheme has been abandoned and other arrangements will be made.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

COLLINS, P., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Rathmore District of the County of Kerry.

ROYAL FREE HOSPITAL.—Acting Assistant Physician: CUTHBERT, HAZEL, H., M.D. Lond. Senior Resident Medical Officer: DEARNLEY, GERTRUDE, M.D. Lond. Junior Obstetric Assistant: DIXON, Miss.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BIRMINGHAM CITY EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £300 per annum.

BRIGHTON COUNTY BOROUGH ASYLUM, Haywards Heath.—Assistant Resident Medical Officer for 4 or 5 weeks. Salary £6 6s. per week and travelling expenses.

BRISTOL GENERAL HOSPITAL.—Casualty House Surgeon. Salary at rate of £175 per annum, with board, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Physician. Salary £150 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BROMLEY EDUCATION COMMITTEE, Kent.—School Medical Officer. Salary £300 per annum.

CAPE TOWN, SOUTH AFRICAN COLLEGE.—Professors of Pharmacology, Pathology, and Bacteriology. Salary at rate of £800 per annum each.

CARDIFF, KING EDWARD VII.'S HOSPITAL.—House Surgeon for six months. Salary at rate of £175 per annum, with board, &c.

CHESTER ROYAL INFIRMARY.—House Physician and Assistant House Surgeon. Salaries £150 per annum, with board, &c.

DARLINGTON GENERAL HOSPITAL.—House Surgeon. Salary £200 per annum, with board &c.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

GRIMSBY AND DISTRICT HOSPITAL.—House Surgeon. Salary £5 5s. per week, with board, &c.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton. House Physician for six months. Salary 30 guineas. Also Resident Medical Officer. Salary £200 per annum, with board, &c.

ITALIAN HOSPITAL, Queen-square, London, W.C.—House Surgeon for six months. Salary £80 per annum, with board, &c.

LEICESTER EDUCATION COMMITTEE.—Two Assistant School Medical Officers (Temporary). Salary £300 per annum.

LIVERPOOL EYE AND EAR INFIRMARY, Myrtle-street.—Female House Surgeon. Salary £150 per annum, with board, &c.

LONDON COUNTY ASYLUMS, Bexley, Kent, and Long Grove, Epsom.—Temporary Assistant Medical Officers. Salary 6 guineas per week, with board, &c.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, near Manchester.—Two Female Resident Medical Officers, unmarried. Salary at rate of £100 per annum.

MANCHESTER, CORPORATION OF.—Temporary Assistant Tuberculosis Officer. Salary £450 per annum.

MILITARY HOSPITAL, Richmond, Surrey.—Whole-time Medical Officer. Salary 24s. per diem.

NEWCASTLE-UPON-TYNE, ROYAL VICTORIA INFIRMARY.—Resident Medical Officer. Salary as arranged, with board, &c.

NEW HOSPITAL FOR WOMEN, Euston-road.—Female House Physician, Obstetric Assistant, Two House Surgeons. Salary £50 per annum, with board, &c. Also Resident Medical Officer at House of Recovery, New Barnet. Salary £60 per annum.

NOTTS EDUCATION COMMITTEE.—Assistant School Medical Officer. Salary £350 per annum.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—District Resident Medical Officer for four months. Salary at rate of £60 per annum, with board, &c. Also Pathologist and Registrar. Salary at rate of £80 per annum, with lunch.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.—Casualty Officer.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician, Casualty House Surgeon, and House Surgeon for six months. Salary £100 per annum, with board, &c.

ROYAL FREE MILITARY HOSPITAL, London, W.C.—Assistant Resident Medical Officer.

SHEFFIELD, JESSOP HOSPITAL FOR WOMEN, GYNÆCOLOGICAL AND MATERNITY DEPARTMENTS.—Junior Female House Surgeon, unmarried. Salary £200 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SOUTH LONDON HOSPITAL FOR WOMEN, South Side, Clapham Common, S.W.—Female House Surgeon for six months. Salary at rate of £100 per annum, with board, &c.

STOCKPORT, COUNTY BOROUGH EDUCATION COMMITTEE.—School Medical Officer. Salary £300 per annum.

SWANSEA EDUCATION COMMITTEE.—Female Assistant School Medical Officer. Salary £300 per annum.

WORCESTER, KING EDWARD VII. MEMORIAL SANATORIUM, Knightwick, near Worcester.—Temporary Medical Superintendent and Tuberculosis Officer. Salary £450 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Chew Magna, Somerset.

Births, Marriages, and Deaths.

BIRTHS.

BROWN.—On May 23th, at Adelaide, South Australia, to Dr. and Mrs. Gilbert Brown, of Snowtown, South Australia, a son. (By cable.)

DAW.—On May 20th, at a nursing home, Leeds, the wife of S. W. P. Daw, F.R.C.S., Captain, R.A.M.C., T., Park-square, Leeds, of a son.

HALL.—On May 24th, at a nursing home, the wife of Fleet-Surgeon J. Falconer Hall, Royal Navy, of a daughter.

REW.—On May 25th, at "Wotton Grange," Bedfont, Middlesex, the wife of Lieutenant G. Russell Rew, R.A.M.C., of a son.

MARRIAGES.

HEBBLETHWAITE—KING.—On May 24th, by licence, at St. George's Church, Leeds, Captain Arthur Stuart Hebblethwaite, M.C., R.A.M.C. (T.), to Elsie Langtry, second daughter of Mr. W. H. King, Bollerton, Cheshire.

ROBBINS—DUCHESNE.—On May 28th, by special licence, Captain Frank Hubert Robbins, R.A.M.C. (T.), to Dorothy Muriel Duchesne, elder daughter of Ernest Collier Duchesne, of Oakwood, Bishop Stortford, Herts.

DEATHS.

ATKINSON.—On May 23rd, at his residence, Comeragh-road, West Kensington, W., John Mitford Atkinson, M.B., aged 60.

CODD.—On May 24th, at Holwood Lodge, Bromley, Kent, of pneumonia, Arthur Frederick Gambell Codd, F.R.C.S., aged 60.

DAPHTARY.—On May 26th, at St. Peter's-square, Hammersmith, Surgeon-Major G. R. Daphtary, I.M.S., retired.

POPE.—On May 4th, officially reported missing, believed drowned on the occasion of the torpedoing of s.s. *Transylvania*, Charles A. W. Pope, M.A., M.B. Cantab., Captain R.A.M.C.

SMITH.—On May 23rd, at a nursing home after a brief illness, Thomas Smith, M.R.C.S., L.R.C.P., aged 47.

TILBURY.—Missing, and believed drowned in the Mediterranean on May 4th, Captain Arthur Tilbury, R.A.M.C., M.R.C.S., L.R.C.P. Lond., aged 29.

WOODROFFE.—On May 21st, John FitzHenry Woodroffe, M.D., of Conna, Shankill, co. Dublin, late of Craven Park, Harlesden, N.W., aged 61.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE VICTUALLING OF THE ROYAL NAVY.

AN appeal for contributions of vegetables and fruit in large quantities for the Navy, issued a few weeks ago, serves to draw attention to the fact that the food-supplies of civilians and the Army have been far more freely discussed than those of the Navy. Nevertheless, diet and disease, especially on board ship, is a subject of continued interest and speculation. In 1903 a little book of 30 pages was written by Dr. Alexander Turnbull, Inspector-General of Hospitals and Fleets (retired), and published by Elliot Stock at the price of 1s., entitled "The Victualling of the Royal Navy, Past, Present, and Future: A Practical Statement compiled from State Papers, Historic Documents, and Official Sources, 1486–1903 and After." The author says:—

> Owing to the courtesy of the Director and the Assistant Director of Victualling, I am enabled to furnish a chronological record of the more important improvements in the naval ration, premising that of late years there has been great improvement in the quality of the provisions supplied. In 1804 sugar and tea were introduced as substitutes for butter and cheese, and by 1824 had replaced those perishable articles. Surgeon Thomas Trotter, M.D., R.N., in his memorable treatise on scurvy (London, 1792), furnishing valuable evidence as to the victualling of the Navy in his time, indicated the authorised issue of cocoa at the end of the eighteenth century. A vegetable ration was introduced between 1806 and 1810; it is, however, possible that by means of the legalised and the prior non-legalised system of "savings" the seamen may have been able to purchase vegetables in harbour on their own account. Beer as a ration was finally abolished in 1831, but on foreign stations long prior to this spirits and wine had of necessity been substituted. In 1832 chocolate was substituted for cocoa, and a most popular substitution this proved to be; "ship's cocoa," as it is called, is an excellent breakfast beverage, sustaining and restorative. In the "sixties" several improvements in naval victualling were introduced; pepper and mustard were added in 1860. Preserved meats were reintroduced, preserved potato, rice, and celery seed, as a flavouring for pea-soup, were introduced into the seaman's dietary in 1867. Soft bread, when in harbour and it can be procured, was authorised as an alternative for biscuit in 1868, and in the same year soluble chocolate was supplied for special issues, in stress of weather, &c., it being more expeditiously prepared than chocolate ordinary, which requires prolonged boiling in its preparation. The final addition was salt.

Reference is made to the preserved meats as supplied to the Victorian Navy in the first instance:—

> The first preserved meats were supplied by Mr. Goldner, of Galatz, in Roumania, where cattle were cheaper than in this country. The first contract was in 1844, for five years, and then renewed. Goldner was a name familiar to naval officers in the "fifties," and long afterwards execrated by "all hands" in the Fleet, in connexion with these atrocious supplies, which were condemned wholesale in the naval victualling yards and afloat as unfit for human food, as it was known that they had been supplied to our Arctic explorers' ships. Some tins were found to contain offal, and some maintained—for which, however, there is no official support, as for the offal—that horses' hoofs and even shoes had been found "canned" by Goldner; numerous tins were bulged by the putrescence of their contents, indicating that their varied contents had not even been effectively preserved.

THE COST OF STARTING A COTTAGE HOSPITAL.

To the Editor of THE LANCET.

SIR,—I live in a village of some 800 inhabitants 16 miles from the nearest hospital town by road and much more by rail. There are 8–10 villages in a short radius similarly situated. We desire after the war to start a real cottage hospital with three or four beds, which would also serve as headquarters for, say, two district nurses. I should be much obliged if any of your readers could give me any information as to cost, &c., from their own experience in similar cases.

I am, Sir, yours faithfully,

May 24th, 1917. N. G.

THE TEACHING OF SEX HYGIENE.

WE have received from the National League for Physical Education and Improvement a series consisting of a pamphlet and four leaflets designed to give parents help in instructing their children in a subject which presents many difficulties, but which is of great importance to the welfare of the child. The pamphlet is by Mrs. House, and is in the form of an address to parents on the moral training of boys and girls, the leaflets being intended to be read respectively to a little child, a boy of 12 to 14, a girl of 11 to 13, and older boys and girls. Their aim is to encourage boys and girls to treat their bodies reverently and not hesitate, through a sense of false shame, to seek from older persons and responsible teachers the information for which the coming of adolescence may prompt a desire. The price of the series is 5*d.* from 4, Tavistock-square, London, W.C.

A SANCTUARY FOR LITTLE PILGRIMS.

UNDER this title Messrs. John Bale, Sons, and Danielsson are publishing at the price of 1s. an illustrated record of the progress of the work of the Sanatorium for Tuberculous Children at Harpenden, Herts, which is a special branch of the National Children's Home and Orphanage. The account is written by Dr. T. N. Kelynack, medical adviser to the Home and visiting physician to the Sanatorium, and there is an introduction by Sir Charles Wakefield, Lord Mayor of London, one of the treasurers, and a foreword by the Rev. William Hodson Smith, the principal. The National Children's Home and Orphanage, which has 15 branches in England and Wales and a centre in Canada, has over 2500 destitute and distressed children in its care and is doing an excellent work. The sanatorium, which was opened in June, 1910, has well justified its existence. Educational training is provided for all children of school age, an open-air school being, of course, a special feature. Even without the letterpress the pictures in the little book themselves tell the story of sickness relieved and children's lives made happy. The London offices of the institution are 104–122, City-road, E.C.

FLOUR VALUE.

To the Editor of THE LANCET.

SIR,—The amount of our labour being dependent on our food supply, and this owing to present conditions limited, would it not be wise for the Food Controller to have every sack of flour labelled with the composition and qualities of its contents? Many cases of indigestion come before me, said to be due to the bread not being perfectly made. At this one is not surprised, as the baker little knows what he is using, and is possibly making experiments at the public expense; if he knew the material he was dealing with, I think the public would be better supplied. "To be forewarned is to be forearmed."

I am, Sir, yours faithfully,
JOHN MCOSCAR, L.R.C.P.Lond., M.R.C.S.Eng.

Buxton, May 13th, 1917.

Justice.—We are not aware of the circumstances in which the Essex Insurance Committee may have refused to allow insured persons to make their own arrangements for medical treatment, but we point out that in the report in our article the London Panel Committee expressly referred to the small number of applications made to them to that effect, and drew a conclusion which does not appear unreasonable.

Medical Diary for the ensuing Week.

SOCIETIES.

RÖNTGEN SOCIETY, at the Cancer Hospital (Free), Fulham-road, S.W.

TUESDAY.—8.15 P.M., Annual General Meeting. Election of Officers and Council for the Session 1917–1918. Adjourned Discussion on the Future of the British X Ray Industry (opened by Capt. R. KNOX). Lieut.-Col. R. Wilson, C.A.M.C., Mr. J. H. Webb, and Mr. H. C. Head are expected to take part.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY.—4 P.M., Lecture VIII.:—Mr. B. S. Rowntree: Welfare Work in Factories. Followed by a discussion.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C. 2.

MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d*. The rates of subscription remain as revised in October.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C. 2, are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION is published in time to catch the weekly Friday mails to all parts of the world.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

Subscribers abroad are particularly requested to note the rates of subscriptions given on page 6.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the rates shown, whatever be the weight of any of the copies so supplied.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, May 30th, 1917.

Date.	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
May 24	...	114	69	55	55	59	Cloudy
,, 25	...	110	72	54	58	63	Fine
,, 26	...	121	80	59	62	68	Fine
,, 27	...	120	81	56	62	71	Fine
,, 28	...	125	79	58	60	68	Fine
,, 29	...	120	78	55	59	63	Fine
,, 30	0·35	107	68	55	54	60	Cloudy

Other information which we have been accustomed to give in these Readings" is withheld for the period of the war.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN.
Root and Branch. By R. Allatini. 6s.
Physical Education in Relation to School Life. By Reginald E. Roper, M.A. 2s 6d. net.
Proposals for the Prevention of Future Wars. By Viscount Bryce and Others. 1s. net.

BAILLIÈRE, TINDALL, AND COX, London.
Surgical Therapeutics and Operative Technique. By E Doyen. English edition prepared by the Author in collaboration with H. Spencer-Browne, M.B. Cantab. Price 25s. net.

BELL, G., AND SONS, Ltd., London.
One Hundred Points in Food Economy. By J. Grant Ramsay, F.R.E.S., with Preface by W. D. Halliburton, M.D., F.R.C.P., LL.D., F.R.S. 1s. net.

CASSELL AND CO., London, New York, Toronto, and Melbourne.
Tumours, Innocent and Malignant: Their Clinical Character and Appropriate Treatment. By Sir John Bland Sutton, LL.D., F.R.C.S. Sixth edition. 21s. net.

FROWDE, H., AND HODDER AND STOUGHTON, London.
Elements of Hygiene and Public Health: Text-book for Students and Practitioners of Medicine. By Charles Porter, M.D., B.Sc., M.R.C.P. Edin. 12s. 6d. net.
The Pneumothorax Treatment of Pulmonary Tuberculosis. By Charles Riviere, M.D. Lond., F.R.C.P. 6s. net.

GREEN, W., AND SON, Edinburgh and London.
The Cancer Problem: A Statistical Study. New edition. By C. E. Green, F.R.S.E.

HOEBER, PAUL B., New York.
Cancer: Its Cause and Treatment. By L. Duncan Bulkley, A.M., M.D. Vol. II. $1.50.
Internal Secretions: Their Physiology and Application to Pathology. By E. Gley, M.D. Translated from the French and edited by Maurice Fishberg, M.D. $2.00.

MACMILLAN AND CO., London and New York.
Public Health Nursing. By Mary Sewall Gardner, R.N. With an Introduction by M. Adelaide Nutting. 7s. 6d. net.
Elements of Anatomy and Physiology for Nurses. By Percy M. Dawson, M.D. 7s. 6d. net.

METHUEN AND CO., London.
Staying the Plague. By N. Bishop Harman, M.A., M.B. Cantab. 1s. net.

WILEY, JOHN, AND SONS, New York; CHAPMAN AND HALL, London.
Laboratory Manual of Organic Chemistry for Medical Students. By Matthew Steel, Ph.D. 6s. net.
Lessons in Pharmaceutical Latin and Prescription Writing and Interpretation. By Hugh C. Muldoon, Ph.G. 6s. net.

The following journals, magazines, &c. have been received:—
Archives of Radiology and Electro-Therapy, Archives de Médecine et de Pharmacie Militaires, American Journal of Orthopedic Surgery, Journal of Hygiene, Clinical Medicine, American Journal of Surgery, North American Review, Canadian Medical Association Journal, Journal of the Missouri State Medical Association, Pacific Medical Journal, Arkiv för Kirurgi, Ophthalmology Bulletin of the Johns Hopkins Hospital, American Journal of Syphilis, American Journal of Roentgenology, American Medicine, Public Health.

Communications, Letters, &c., have been received from—

A.—Anglo-French Drug Co., Lond.; Messrs. Arnold and Sons, Lond.; Archives et Documents de Guerre, Val de Grace, Directeur de; Major T. M. Allison, R.A.M.C.(T.); Messrs. Allen and Hanburys, Lond.; Mr. H. W. Abbott, Lond., Aberdeen, Medical Officer of Health of; Anglo-Russian Hospital, Sec. of; A. P. W.

B.—Mr. W. F. Brook, Swansea; Lady Bowlby, Lond.; Messrs. C. Barker and Sons, Lond., Surg. F. J. F. Barrington, R.N.; Bromley Education Committee, Clerk to the; Dr. B G. Barker, Lond.; Prof. D. T. Barry, Cork; Mr. G. T. Birkett, Lond.; Messrs. W. H. Bailey and Son, Lond.; Messrs. James Bacon and Sons, Newcastle-on-Tyne; Prof. W. Bulloch, Lond.; Mrs. Behnke, Lond.; Mr. S. T. Beckett, Leeds, Dr. Grace Briscoe, Lond.; Mr. J. A. Barns, Fife, Northern Rhodesia; Mr. E. L. Burton, Stansted.

C.—Capt. A. Compton, R.A.M.C.; Col. J. Cantlie, R.A.M.C.(T.), Mr. L. D. Cohen, Lond.; Messrs. J. and A. Churchill, Lond.; Messrs. Crossley and Co., Lond.; Mr. H. A. Collins, Croydon; Dr. E. Cundall, Anlu, China; Capt. E. Coplans, R.A.M.C.; *Civil Service Gazette*, Lond., Children's Country Holidays Fund, Lond.; Mr. E. M. Corner, Lond.; Nurse Clowes, Weston; Capt. G. W. Christie, R.A.M.C.; Commonwealth of Australia, High Commissioner's Offices, Lond., Supply Officer of; Chester Royal Infirmary, Hon. Sec. of.

D.—Mr. J. K. Daji, Bombay; Capt. C. R. Denny, R.A.M.C.; Darlington Hospital, Sec. of; Dr. A. De Capua; Director-General of Food Economy, Lond.; Dr. T. Dutton, Lond.; Mr. J. Dawson, Lond.

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A Lecture ON DIGITALIS IN AURICULAR FIBRILLATION.[1]

Being the Sydney Ringer Memorial Lecture delivered at University College Hospital Medical School

BY ARTHUR R. CUSHNY, M.D. ABERD., F.R.S.,
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GENTLEMEN,—From the first introduction of digitalis into therapeutics its influence on the rate of the heart was recognised. The statement of the early writers generally runs that the pulse is slower and more regular, but this is much more pronounced in some cases than in others; and it is the general feeling that it is most marked in very irregular pulse. This slow pulse of digitalis, which was the only objective change in the circulation which could be observed by the methods of the time, received much attention from clinicians in the first half of the nineteenth century, but no further progress was made until Traube in 1851 showed that in mammals large doses injected intravenously slowed the pulse by stimulation of the vagus centre, and after some discussion this was generally accepted as the explanation of the slow pulse observed in clinical cases treated with digitalis. The stimulation of the vagus centre is undoubtedly the cause of the slowing in experimental animals under digitalis, for it disappears when the vagi are cut or paralysed with atropine. More than a century after the introduction of digitalis the knowledge of its therapeutic action had made but little further progress, and was meagre and unsatisfactory. During the last 20 years, however, considerable advance has been made owing to the introduction of the new methods of analysing cardiac arrhythmias.

AURICULAR FIBRILLATION.

In 1905 Mackenzie differentiated a special form of heart irregularity in which digitalis proved especially valuable and in which it generally caused a more marked fall in the rate of the pulse than in other forms of heart disease. This irregularity was that now known to arise from auricular fibrillation. In other conditions digitalis is no doubt of value and it also slows the pulse, but in auricular fibrillation with a rapid and extremely irregular pulse it is almost a specific, and here the slowing of the pulse proceeds parallel with the general improvement, while in other conditions the two effects show no such definite relation; in these the pulse may be slowed without the general condition being better or there may be no significant change in the pulse, while the breathlessness and other symptoms are alleviated. On looking over the older records one recognises that in the cases in which digitalis was most effective and caused the greatest slowing of the pulse the condition was in all probability what is now known as auricular fibrillation.

I may remind you that in auricular fibrillation the pulse is characterised by extreme irregularity in rhythm and in strength and the force of the beat bears no definite relation to the length of the preceding interval. The venous pulse tracing (Mackenzie) and the electro-cardiograph (Lewis) give no indication of a true auricular contraction, and in accordance with this a presystolic murmur present before the inception of fibrillation disappears on its onset (Mackenzie). The electro-cardiograph shows that the auricle is not at rest, however, by a series of minute oscillations which persist throughout.

The interpretation of these conditions is that the pace-maker has lost its leadership and that its regular beating has been superseded by multitudinous impulses which arise from many points of the auricle and keep that chamber in continuous incoördinated activity; one fibre relaxing while another contracts, no change in the total volume of the chamber results, and blood is not driven into the ventricle. This mob of impulses from the auricle in passing to the ventricle is reduced in number by the auriculo-ventricular band being unable to transmit them rapidly, and it may be supposed that of those which actually reach the ventricle a certain number are ineffective through striking it at a refractory period in its cycle. But enough of them pass to it to cause a very irregular rhythm, and this is accompanied by a marked loss in efficiency, as is shown by a fall in the blood pressure which ensues at once when the regular rhythm of the heart gives way to auricular fibrillation.

ACTION OF DIGITALIS.

Under suitable quantities of digitalis in this condition the pulse becomes slower and the beats are less unequal in strength. If the drug is pushed, the pulse may run down to about 40 and become quite regular and equal. And as the pulse falls in rate the general condition improves in the most unmistakable way, breathlessness, dropsy, and lividity disappearing rapidly. The rate of the blood-flow through the peripheral vessels has been measured by Stewart and Scott, who found it quickened as the pulse falls in this condition.

This change is not due to any change in the condition of the auricle, which continues to fibrillate as before, as is shown by the character of the venous pulse remaining unchanged (Mackenzie) and by the persistence of the oscillations in the electro-cardiogram (Lewis). The impulses must therefore be generated in the auricle as before the treatment began, but they can no longer act upon the ventricle in such profusion, and it therefore beats more slowly and more regularly. The conduction of impulses from auricle to ventricle is less rapid then before digitalis was given (Lewis). This salutary impairment of the conductivity can be induced by stimulation of the vagus in man and in animal experiments during auricular fibrillation, while the oscillating contractions in the auricle remain unchanged by the inhibition—that is, the effects under digitalis may be exactly simulated by stimulation of the vagus, and it was therefore natural to attribute the action of the drug in auricular fibrillation to its stimulating the vagus centre in the way which has been shown in normal rhythm in man and animals. The pleasant harmony between the clinical and the experimental results appeared to be unimpaired.

But in a number of observations which I made in Mackenzie's wards along with Marris and Silberberg we satisfied ourselves that in auricular fibrillation the change in conduction is not inhibitory in nature, for it is not prevented by complete paralysis of the vagus by atropine; it must therefore arise from some direct action on the connecting tissue.[2]

On the other hand, the slowing observed under digitalis in most other cardiac conditions in man was removed by atropine; here the action was induced through the inhibitory mechanism. In experiments on animals, I found that when the vagus was cut or paralysed with atropine, digitalis did not slow the pulse and the conduction remained unimpaired until an advanced stage in poisoning far beyond that seen in the therapeutic use. Even when auricular fibrillation was induced in these experiments by electrical stimulation, the irregularity persisted unchanged by digitalis if the vagi were previously put out of action.

We have thus two types of digitalis action in the heart. In the first, which may be called the normal reaction, the heart is slowed through excitation of the inhibitory mechanism. This occurs in hearts in normal rhythm both in man and animals. The second or anomalous reaction occurs only in the auricular fibrillation in man and not in that experimentally induced in normal animals; here the heart is slowed by direct action on the muscle independently of the inhibitory mechanism.

There thus appeared to be a specific reaction in auricular fibrillation in man which differed from that known else-

[1] Fuller details of the experiments will be published in a paper in the Journal of Pharmacology and Experimental Therapeutics.

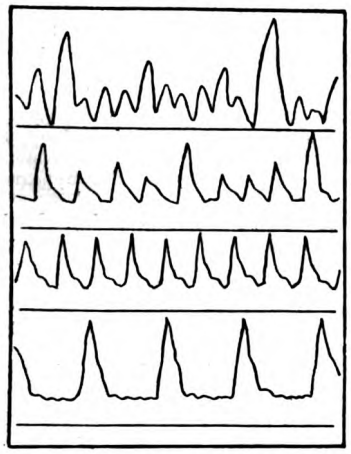
[2] This view has been contested by Sutherland in the Lumleian Lectures (THE LANCET, March, 1917), who points out that the inhibitory mechanism is excited in a high degree by digitalis and that doses of atropine may be unable to paralyse it under this excitation, though they suffice to put it out of action in ordinary conditions. This objection arises from a misconception. Digitalis excites the vagus inhibitory centre in the medulla, while atropine paralyses the terminations in the heart, and their action is thus not antagonistic on the same tissue, and the excitation does not oppose the paralysis. This is shown by the fact that when atropine has been used electrical stimulation of the vagus does not slow the heart, however much the strength of the shocks is increased. In the same way, however much digitalis excites the inhibitory centre, the impulses fail to affect the heart after atropine. No amount of excitement and shouting at one end of a telephone wire will be effective if the other end is disconnected from the receiver.

where. It is true that some analogies are presented in experimental conditions. Thus it was shown by Fagge and Stevenson (1865) that in the frog digitalis often causes intermission of the ventricle, while the auricle continues in its ordinary rhythm, and this irregularity is now known to be due to failure of the conduction through direct action on the heart, for it continues after atropine. Similarly in a late stage of poisoning in mammals digitalis interrupts the passage of impulses along the auriculo-ventricular fibres through a direct action on them. But these analogies can hardly be applied to the problem of auricular fibrillation in man, for the frog is too distant a relation to the sick patient, and the impairment of conduction in mammals from direct action occurs only in a late stage of poisoning.

EXPERIMENTS ON THE ANOMALOUS REACTION TO DIGITALIS.

It seemed possible that the anomalous reaction was peculiar to the form of auricular fibrillation in the human heart, and this unsatisfactory view could only be refuted by changing the condition of the mammalian heart so that it too would give the anomalous reaction. During the last two years I have succeeded in doing this in the surviving heart of the rabbit and cat perfused with Ringer's solution. When the perfusion has been carried on for some time—20 to 30 minutes—and auricular fibrillation is excited by electrical stimulation, the administration of strophanthin slows the beat of the ventricle and makes it more regular, while the fibrillation of the auricle continues unchecked. (Fig. 1.) This occurs though the vagi have been cut in the preparation and though the peripheral mechanism is paralysed by atropine added to the Ringer. Finally a slow, perfectly regular beat is observed in the ventricle, while the auricle continues to fibrillate; the multitudinous impulses emitted by it fail to react on the ventricle, which takes up its own slow rhythm. The reaction to digitalis of these perfused hearts in auricular fibrillation is thus exactly analogous to that of the human heart in spontaneous auricular fibrillation.[3]

FIG. 1.



Tracings of the perfused rabbit's ventricle during auricular fibrillation from electrical stimulation. The highest tracing was taken before strophanthin was applied, the second after it had begun to produce its effect, and the third and fourth after the ventricle had become regular. The fibrillation persisted in the auricles.

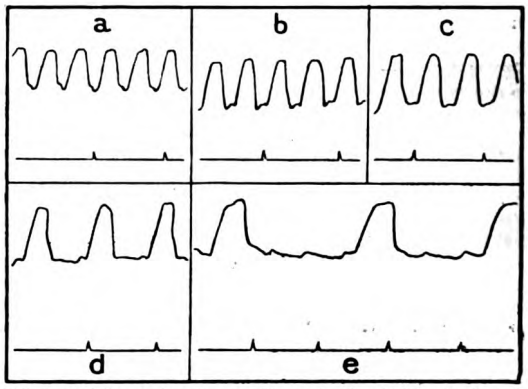
The anomalous reaction is therefore not specific to man, but is also elicited in animals under abnormal conditions.

The two types of digitalis reaction may thus be elicited at will in animals according to the method of preparation. There seemed a prospect that some light might be shed on the condition of the heart in auricular fibrillation in man by an examination of the conditions in which the anomalous reaction was obtained in animals.

I examined the effect of the perfusion of strophanthin 1 : 500,000 of Ringer's solution in the surviving rabbit's heart beating in normal rhythm. The first effect noticed was generally a slowing of the beat of the whole heart, which indicates that the pacemaker was depressed. Sooner or later the ventricle began to miss beats occasionally, while the rhythm of the auricle remained regular; this indicates that the conduction of impulses from auricle to ventricle is impaired and the further progress of this lesion leads to more frequent intermission, half rhythm, and finally to the ventricle only responding to every fourth or sixth beat of the auricle. (Fig. 2.) This action on impulse formation and conduction was unchanged by the addition of atropine to the perfusing fluid, so that it must have arisen from a direct action on the conducting fibres and not from excitation of the intracardiac inhibitory mechanism.

The changes in rate of the perfused heart under strophanthin are accompanied by increased strength of contraction and lessened diastole, but these are common to both the perfused heart and the heart *in situ*, so that they need not occupy us in the present problem. It must be added that the slowing under strophanthin in the perfused heart has been noted by several previous investigators.

FIG. 2.



Rabbit's ventricle perfused. *a*, Normal; *b*, slight slowing from strophanthin; *c*, more marked slowing; *d*, half rhythm; *e*, rhythm of 1 : 4 and 1 : 3; the auricle beats can be seen during the intervals in *e*.

When a heart is perfused with strophanthin and its response is tested to auricular fibrillation at intervals, it is found that during the earlier stage of slowing the auricular excitation has the usual response in the ventricle, but later, before the actual intermissions occur, the irregularity of the ventricle during auricular fibrillation becomes less marked, and still later the ventricle remains fairly regular while the auricle fibrillates. There can be no question that the decreased conduction of the perfused heart under strophanthin is the explanation of the improvement observed from strophanthin in the perfused heart when the auricle is fibrillating.

We have thus two separate reactions to the digitalis group—one which is seen in patients with normal rhythm and in animals with the heart *in situ*, and in which the slowing is inhibitory in character, the other seen in auricular fibrillation both in man and in the perfused mammalian heart, when the slowing arises from direct action on the heart tissue.

THE PART PLAYED BY MALNUTRITION OF THE HEART.

The anomalous reaction seen in the last case is obviously not caused by the auricular fibrillation, for it does not occur in animals' hearts *in situ*, and in addition an analogous change is seen in the perfused heart when no auricular fibrillation is present. Some change in the condition of the heart quite apart from the fibrillation must therefore be the underlying ground for the change in reaction. And as the change can be caused in the animal heart by substituting perfusion for the ordinary circulation, it is interesting to speculate on its nature.

The perfused mammalian heart shows many differences in reaction from the normal heart. It is much more adapted for studies in experimental pathology and therapeutics than for the elucidation of the normal physiology. And, indeed, not much is to be expected of it, for it receives no source of energy except inorganic salts. Even oxygen is given it in inadequate measure, for Evans calculates that the heart perfused with Ringer's solution must receive about three times its weight of fluid per minute to satisfy its oxygen needs, and no perfusion ever approaches this ideal in my experience. The perfused heart is therefore a starved heart, and its starvation (food and oxygen) appears to me the explanation of its anomalous reaction to digitalis. This view is strengthened by the fact that the reaction is seen best when the heart is perfused for some time before the strophanthin is given; apparently the state of nutrition is only reduced slowly, so that if the drug is applied immediately after the perfusion is commenced, the reaction may depart much less from that seen in the heart *in situ*. And further, those observers who have perfused the heart with blood do not seem to have observed any such slowing and block under

[3] After this research was well advanced, Professor Edmunds, who was my collaborator in describing the first case of auricular fibrillation recognised in man, wrote me that he also had observed the occurrence of this reaction in animals in auricular fibrillation, and had demonstrated it to his class repeatedly. He thus discovered it independently and apparently before my experiments.

strophanthin as form the most striking feature of action on the heart perfused with Ringer's solution.

There are, therefore, sufficient grounds for ascribing the change in the reaction of the perfused animal heart to malnutrition. Are we justified in drawing an analogy to the human heart in auricular fibrillation? Is the fundamental factor here the malnutrition, the auricular fibrillation only a secondary one? There are some grounds in support of this view. Thus in two cases in which there was normal rhythm in man we obtained slowing and block from digitalis, and these proved to be due to direct action, for they were not removed by atropine. Thus the human heart can give the anomalous reaction even when the rhythm is previously normal. On the other hand, some cases of auricular fibrillation in man fail to give the anomalous reaction. It is therefore proved that this reaction is not inseparably attached to auricular fibrillation. And there is, on the other hand, evidence that the heart muscle is gravely injured in cases of fibrillation. Thus the irregularity is greater than is accounted for by the fibrillation alone. And the absence of proportion between the strength of the individual beats and the duration of the preceding interval has been ascribed to a condition of the heart fibre somewhat analogous to that which gives rise to the pulsus alternans. There is therefore justification for the view that in the human heart also the essential character is not the auricular fibrillation but the underlying weakness of the heart muscle.

I do not mean to suggest that this debilitated state of the heart is the sole ground for the anomalous digitalis reaction, and that the auricular fibrillation is an altogether independent feature. For if this were the case, it would be impossible to explain why this reaction occurs so frequently in auricular fibrillation and so seldom in other forms of cardiac debility.

The connexion may be somewhat as follows. In extreme malnutrition of the heart, such as is seen in the perfused rabbit's heart, the anomalous digitalis reaction is elicited without fibrillation. In man this state is comparatively seldom seen while the rhythm is of the normal type, but the onset of auricular fibrillation often induces it. That auricular fibrillation is capable of aggravating greatly any inefficiency already present is obvious. For in normal rhythm there is a measured sequence of events, and due time is given for the recovery of the ventricle from its contraction. In fibrillation a constant storm of impulses beats on the ventricle, it has no longer time to recover from its contractions, and the previous debility is aggravated. In addition, the smaller efficiency of the heart in this rhythm is shown by the marked fall in blood pressure, and this must further tend to impair the hard-pressed heart.

The view I would present is that the anomalous reaction of digitalis arises from malnutrition of the heart primarily, but that this state of malnutrition is exaggerated by the demands made on the heart in auricular fibrillation, which thus contributes to the debility and leads to the anomalous reaction secondarily.

In some cases of well-marked auricular fibrillation digitalis has little effect in slowing the pulse, and in these the condition of the heart is less serious. Here there is unquestionably a certain degree of malnutrition, but the ventricle is protected by imperfect conduction from the mob of impulses from the auricle, and the extreme malnutrition which accompanies the very rapid pulse of typical auricular fibrillation is not developed. Digitalis, therefore, does not produce the anomalous reaction.

In the account I have given of the action of digitalis in auricular fibrillation the effective action is the blocking of impulses from the auricle. Another result of digitalis on the animal heart is the increase in the strength of contraction. Does this play no part in the improved efficiency of the heart? This cannot be answered at present, as we have no means of measuring accurately the contraction of the human heart. Undoubtedly the movement is stronger, but this may be due to the slower beat, which allows of a better recovery in the period of rest. In the perfused animal heart the systolic increase occurs at least as soon as the lessened conduction, and this seems evidence in favour of the improved circulation in patients also depending in part on the increase of systole. But the argument, I admit, is not convincing, since in perfusion experiments the dose of digitalis is necessarily larger than that used in man in order to bring on the action within the time-limits of an experiment.

THE TREATMENT OF SOME COMMON WAR NEUROSES.

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THE war neuroses with which we are concerned are those in which the patient suffers from some objective disorder such as paralysis, loss of speech, &c., without showing any signs of organic change in the central nervous system. These disorders often occur as the result of mental and physical exhaustion, violent explosions, &c., and they often constitute a very serious disability. They form a well-defined group which is readily distinguished from the neurasthenic and psychasthenic conditions where the patients have subjective complaints, headaches, feelings of exhaustion and depression, and very little in the way of physical signs; at the same time it is a difficult matter to find a suitable name for them. Were it not for the stigma attaching to the word, one would not hesitate to class them as hysterical. However, a diagnosis of hysteria is often held to mean that the patient has nothing the matter with him and requires no treatment. This is manifestly absurd in the case of a man who has been stone deaf for months; his disability is real enough and is in urgent need of treatment. As a rule the difficulty can be overcome by speaking of the disorder as functional rather than hysterical. However, the objection to the term functional is that it covers too wide a field. It applies to any condition which has no demonstrable organic basis, and it would include such disorders as neurasthenia and even epilepsy. We need some name for the neurosis which results in the production of objective signs simulating those due to organic disease, and for the present hysteria is the only term we can use. Babinski has coined a word, pithiatism, to take its place, but the word has not yet won acceptance and for the present we have been forced to adhere to the term hysteria in spite of its manifest disadvantages.

The object of this paper is to describe a method which we have found to be extremely useful in dealing with this type of war neurosis. It has been applied in upwards of 250 cases which have included all the most common types of hysterical disorder; we have records of 82 cases of mutism, 34 of deafness, 18 of aphonia, 37 of monoplegia of the arm or leg, 46 of paraplegia, 16 of hemiplegia, and 18 of disordered gaits not associated with organic change. The majority of the cases have been of several months' standing, but in spite of this the treatment has been almost immediately successful in at least 95 per cent. of the cases in which it has been applied.

The method is certainly not new, indeed it is probably employed in some measure by all who have had much to do with functional disorders, and recently several French neurologists have called attention to its value in the treatment of military cases.[1] However, very little reference has been made to it in recent English literature, and it is not easy to find any comprehensive account of the treatment of disorders of the hysterical type in the average text-book of medicine or even of neurology. At most we find a few lines devoted to the subject of treatment, and we are left with the impression that our task is at an end when we have succeeded in establishing the diagnosis. In war-time this is obviously not enough: adequate treatment is essential, and it will make all the difference between a useless burden to the State and a useful civilian or even a useful soldier.

It is quite true that a correct (or rather a confident) diagnosis is the first step. Indeed, the most important part in the treatment of a functional case consists in making up one's mind that the case is functional. To do this presupposes a knowledge of the signs of organic nervous disease

[1] Vincent: Le Traitement des Phènomènes Hystériques par la Ré-éducation Intensive, Tours, 1916. Babinski et Froment: Hystérie-Pithiatisme, &c., Paris, 1917. Rosanoff-Saloff: Considérations Générales sur la Camptocormie. Nouvelle Iconographie de la Salpêtrière, 1916-1917.

and the points of distinction between functional and organic disorders. However, these have been described often enough, and it is our impression that failure in dealing with these cases is as often due to inadequate treatment as to incorrect diagnosis. For this reason we have dealt with the subject of treatment in some detail and have not attempted to discuss points of diagnosis.

The method to be discussed has the advantage that it does not require any special experience (other than that needed to establish the diagnosis), and only demands a certain degree of confidence on the part of the operator. When properly carried out it is extremely rapid and almost invariably successful, even in cases which have been treated by other methods for months or years without result. The method has its limitations, and in particular it does not apply to the exhausted, neurasthenic type of patient who complains of headache, insomnia, &c., and has no physical symptoms, but only to that type of neurosis where the disability is some objective symptom, paralysis, loss of speech, &c.

The Aims of Treatment.

The different forms of treatment in vogue can be best understood by considering the mental characteristics of patients suffering from this form of neurosis. Though it may seem unjustified to make a psychiatric grouping of these cases, yet there are certain mental abnormalities which are present to some extent in nearly every patient. Indeed, anyone visiting hospital wards where functional and organic cases are treated together cannot fail to be struck by the great difference in the mental outlook of the two classes. The chief phenomena underlying the hysterical type of mind are weakness of the will and of the intellect, hypersuggestibility and negativism. The majority of patients are below the average normal intelligence as judged by the Binet-Simon scale, and others who are more highly equipped prove to have an unstable history either personally or in the family. Their hypersuggestibility is shown by the mode of production of their symptoms and by the ease with which the physician can suggest such conditions as anæsthesia, contraction of the visual fields, &c. At the same time there is a pronounced element of negativism which may amount to a mere inertia or to an active, but not necessarily a conscious, resistance to the idea of recovery. Conditions of negativism are often seen on attempts at movement when the antagonistic muscles overact, when the patient moves backwards when he is told to move forwards, &c. The unconscious resistance is often well marked and must be broken down before any results can be obtained. A combination of hypersuggestibility and negativism may seem to imply a contradiction, but the two are not difficult to reconcile. The patient has a fixed idea that he is dumb or paralysed and he resists all criticism of this idea, but outside this he responds to external suggestions much more readily than a normal person. Indeed, the fixed idea is developed as the result of auto-suggestions acting on a mind enfeebled by fear and emotional tension and this auto-suggestion becomes so strong that the patient resists all attempts to undermine his fixed belief.

These facts are important because they show that we must take into account two distinct conditions in considering treatment and prognosis. These are (*a*) the fixed idea which is giving rise to the functional symptom, paralysis, loss of speech, and so forth, and (*b*) the state of mind which has allowed this fixed idea to develop. The fixed idea can be treated successfully by suggestive methods and the patient can be restored to apparent health, but there is no reason to suppose that his mental instability will vanish. He will always be liable to develop hysterical troubles in moments of emotional stress and exhaustion, just as a man with a malformed chest will be liable to attacks of bronchitis. As Pitres said: "En réalité on nait hystérique, on ne le devient pas."

Psycho-analysis.

There is, however, one method of treatment which lays claim to the power of curing not only the hysterical symptoms but also the hysterical mentality. This is the method of psycho-analysis which is based on the idea that the hysterical type of mind is the result of a buried and unfulfilled wish dating from early infancy and concerned with some fundamental sexual longing. The idea was suppressed because it came into conflict with accepted notions of morality and conduct and its repression has led to a permanent state of tension and unconscious mental conflict. The hysterical symptom is supposed to be simply the emotional expression of the repressed desire or of some secondary conflict due to this desire. When the original infantile desire has been unearthed and explained to the patient, the repressed conflict will vanish and with it not only the hysterical symptom but also the state of mind which made this symptom possible.

It is difficult to avoid the belief that suggestion must play a large part in the cure of those cases where the treatment is successful, but it is not easy to judge of the merits of psycho-analysis because its tenets seem to call either for whole-hearted approval or else for whole-hearted abuse, and the middle course is deplored by both parties. However, the method has certain obvious disadvantages, even though we accept everything which has been said in its favour. It entails a considerable degree of training on the part of the operator, and a considerable degree of intelligence on the part of the patient, and it is a process which demands a great deal of time and individual attention. Indeed, the course of treatment may run into years if a serious attempt is made to cure the hysterical mind by purging it of all the accumulated filth of a lifetime; and if the analysis is not carried through as thoroughly as this the state of tension will remain in some degree and the treatment will have little advantage over the much more rapid methods which are concerned only with the alleviation of the immediate symptoms. Whether the result would justify a lengthy psycho-analysis is another matter, but in any case the time at our disposal is not unlimited, and for this reason alone the treatment is best left to special hospitals dealing with specially selected cases.

Treatment of Symptoms.

We may pass on, then, to consider those methods of treatment which aim only at relieving the functional symptoms and do not profess to give the patient a new mind. There are three principles involved in all these methods—namely, (1) suggestion, (2) re-education, and (3) discipline. The aim of suggestion is to make the patient believe he will be cured, and to lead him on from this to the belief that he is cured. Re-education brings the disordered function back to the normal by directing it until the bad habit is lost, and disciplinary treatment breaks down the unconscious resistance of the patient to the idea of recovery.

One might add a fourth line of treatment, which consists in adopting the attitude of Mr. Micawber and waiting for something to turn up. Probably this course is often adopted because there is some doubt as to the diagnosis. When it is uncertain whether a paralysis is functional or organic it is perhaps natural enough to leave it alone in the hope that time will show the difference. Fortunately, a certain number of functional cases do recover when left to themselves, but a large number do not, and expectant treatment may keep a patient for six months in hospital when more vigorous measures would have removed his symptoms in a week. Moreover, the atmosphere of a hospital is distinctly enervating and a functional case is rarely the better for a prolonged stay in the wards even though the symptoms may have improved.

Hypnotism.

As an example of a process which aims at curing by pure suggestion we may instance treatment by hypnotism. The treatment consists in reducing the patient to a state of mind in which his critical faculties are in abeyance and then suggesting verbally that his disability no longer exists. Most hysterical patients, being hyper-suggestible, are very easy to hypnotise lightly. They will readily accept the idea that they cannot open their eyes or move their limbs and they will comply with any suggestion which does not relate to their disability. Unfortunately they are not nearly so tolerant when the suggestion touches their fixed belief that they cannot speak or that their legs are paralysed, and it requires a far greater ascendancy on the part of the operator before they will agree to suggestions which are curative and not merely ornamental. One has only to be hypnotised to realise this state of mind. Unimportant suggestions are readily accepted, but anything which runs counter to one's favourite prejudices is simply dismissed as absurd. With a patient who is intelligent and anxious to get well hypnotism may be extremely successful, and it is certainly of great value in the treatment of subjective troubles such as

insomnia, fighting dreams, &c.,[2] which can scarcely be classed as hysterical. However, in the majority of functional cases where the resistance is at all marked our limited experience of the method has led us to believe that it is slow and uncertain in comparison with vigorous suggestive treatment and re-education.

Isolation.

As an example of treatment in which the disciplinary element is very much to the fore we may instance the use of strict isolation in hysterical cases. This supplies the needful stimulus to recovery by making the patient's illness a dreary and unprofitable business instead of a source of pride and satisfaction. For this reason it is extremely useful in cases of functional tremors and pseudo-chorea where the patient becomes quiet as soon as he is deprived of his audience. It is not suggested that isolation acts in this way in every functional disorder. The frightened, exhausted neurasthenic is often much happier when left to himself with nothing to disturb him, and it would be absurd to regard isolation as a disciplinary measure in such cases. But in those cases where disciplinary measures seem to be indicated we doubt if isolation is an advisable form of treatment. It may eventually force a patient to release his claim to a supposed disorder, but the process may take some time and is rarely as effective as a little plain speaking accompanied by a strong faradic current. Moreover, eight hours' rest out of the 24 is, to our mind, quite sufficient, and extension of that time in one who has no indication of physical illness is more liable to do harm than good. The disciplinary element may be assumed to enter into any form of painful suggestive treatment; it is often unnecessary, particularly in those cases where the disability is irksome enough by itself and the patient is anxious to get well; but in many cases it is a very important part of the treatment since it is the only certain means of breaking down the patient's resistance to the idea of recovery.

Persuasion.

Under the heading of re-education we might include the method of simple persuasion in which the patient is convinced by logical argument that his condition is not so serious as he supposes.[3] The difficulty with this form of treatment lies in the fact that a patient of average intelligence does not easily realise that his physical disability is due to a mental and not to a physical disorder. If an attempt is made to explain the real state of affairs to him he is generally left with the impression that he is suspected of malingering. It seems only natural to him that his cure should be brought about by some physical means, and therefore he will respond to some simple suggestive measure when persuasion or re-education would leave him untouched. In certain cases, notably in mutism and aphonia and in the spastic type of paraplegia, a rapid re-education is often quite enough by itself, but as a rule the patient will have greater confidence if he has received some preliminary suggestive treatment.

Suggestive Treatment and Re-education.

For this reason the method which we have finally adopted consists in a very brief suggestive treatment followed by rapid re-education, which is continued, if possible, without a pause until the normal function is entirely regained. The details will be discussed in dealing with the different functional manifestations, but there are certain general considerations which hold good in every case.

The suggestive treatment may take any form, but it is essential that the patient should be convinced that it will produce an immediate recovery. In untreated cases there is rarely any difficulty in this, and the conviction can be strengthened by using a form of treatment which will be capable by itself of evoking some part of the function which is temporarily in abeyance. For instance, a case of mutism may be cured by tickling the back of the mouth so as to induce reflex phonation. The patient is compelled to make a noise, and the fact that he has done so will convince him that the treatment will be effective. In the same way a strong electric stimulus will produce a sensation and motion in a limb which is supposed to be anæsthetic and paralysed, and this in itself will be enough to convince the patient that he is on the road to recovery. Occasionally this form of treatment has been tried before and has failed because the operator had not enough confidence in the method. In this case it is, of course, useless to repeat the same procedure, and we must fall back on some other form of treatment in which the patient will have greater faith.

The simplest form of suggestive treatment to apply is the faradic current. The therapeutic uses of electricity are still mysterious enough to the layman, and nearly every patient is willing to accept the suggestion that some form of electricity will cure him. The current can be made extremely painful if it is necessary to supply the disciplinary element which must be invoked if the patient is one of those who prefer not to recover, and it can be made strong enough to break down the unconscious barriers to sensation in the most profound functional anæsthesia. The only difficulty arises when the patient has already been subjected to a long course of electrical treatment without result. It often happens that a patient, either from mistaken diagnosis or mistaken ideas of treatment, has been given daily applications of some innocuous form of electricity in the belief that the electricity by itself will do all that is necessary. Such treatment, unaccompanied by the necessary suggestions, is generally quite useless in a functional case, and, as a rule, the only result is to accustom the patient to electrical stimuli and to foster the idea that his case is hopeless. It is easy to satisfy one's self that in these cases the sole value of electrical treatment lies in the suggestive effect it can be made to produce. We have watched a nurse administering the treatment to a paralysed limb, rolling the electrode up and down, sometimes with eyes shut and sometimes with eyes open, to say nothing of an occasional yawn. Needless to say, the patient remained paralysed, and the only result was so much current wasted. On the other hand, the same patient given exactly the same form of electricity with persuasion recovered completely in a few minutes.

When the patient tells us that he has already been treated by electricity it is as well to find out whether the treatment was painful or not. If it was not, the patient will generally yield at once to painful faradisation with a wire brush after he has been informed that this kind of electricity is far more potent than any he has had previously. If this, too, has been tried before, the suggestive treatment must take an entirely different form. As an instance of this we may quote the case, recently treated by one of us, of an officer who had a functional paralysis of the arm which had persisted for two years in spite of prolonged treatment by hypnotism, psycho-analysis, rest, massage, anæsthesia with ether, and electrical treatment which had included several extremely painful applications of electricity to the arm. He knew something of the functions of the brain and took a great interest in his condition, which he was prepared to discuss exhaustively. He was told that he had come to be cured, and that for the present he must be content with this; the nature of the cure would be explained to him afterwards. Without any further discussion the motor areas of the cortex were mapped out roughly, the measurements being repeated aloud to impress and mystify the patient. He was told that as soon as the shoulder area of the cortex was stimulated by faradism he would be able to raise his shoulder and that the rest of the arm would recover in the same way. A very mild faradic current was applied for a few seconds to the scalp, and he was then ordered to move his shoulder. He did so at once, and in a few minutes the whole of the paralysis had disappeared and he could raise 30 pounds. We believe that the success in this case was due in a large measure to the fact that the patient was not allowed to discuss his case or to criticise the proposed treatment. The value of this will be pointed out immediately.

Whatever form of treatment is employed, the patient must be convinced that the physician understands his case and is able to cure him. This idea should be fostered from the moment the patient enters the ward. The case is investigated as briefly as possible, and each physical sign is accepted as perfectly normal in the circumstances, and not as in any way interesting or obscure. The best attitude to adopt is one of mild boredom bred of perfect familiarity with the patient's disorder, and if the case has to be exhibited to anyone else it is shown not as anything unusual, but as a perfect example of the type of case which is cured in five minutes by appropriate treatment. After the examination the patient is met with the absolute assurance that

[2] Cf. Hurst: Medical Diseases of the War, 1916.
[3] Dubois: Psychic Treatment of Nervous Disorders.

he will be cured as soon as the physician can find the time to treat him. He is told that he will not need to stay in hospital for more than a few days, and that he can write and inform his friends of this. It is usually necessary to find out what treatment the patient has had before to avoid the risk of repeating a procedure which has already been tried and found wanting, but apart from this it is better to avoid discussing the case and the methods which will be adopted to cure it. The barest statement should suffice, and the patient should be silenced at once if he attempts to air his own views on the subject. An argument in which the physician does not seem perfectly sure of his ground is likely to weaken his authority at the moment when it should be absolutely unquestioned, and an air of complete assurance is far more convincing than the most elaborate reasoning.

The treatment is best carried out in a special room set apart for the purpose, where there will be nothing to distract the patient's attention. As soon as the least sign of recovery has appeared the re-education is begun. The patient is given no time to collect his thoughts, but is hurried along by a mixture of persuasion and command until the disordered function has completely recovered. The patient is never allowed any say in the matter. He is not asked whether he can raise his paralysed arm or not; he is ordered to raise it, and told that he can do it perfectly if he tries. Rapidity and an authoritative manner are the chief factors in the re-educative process, and in every case an effort should be made to produce complete recovery before the patient goes back to the ward. If the treatment has to be discontinued before recovery is complete the patient should be assured that he will be quite well in 24 hours and the re-education should be continued as soon as possible.

There are many details which are best considered in connexion with particular hysterical symptoms, and therefore we shall describe the most common affections in which the suggestive method is pre-eminently successful. The most common disorder is the complete or partial loss of a normal function, and the most common functions to be lost are those concerned with hearing and speaking and with the sensation and motion of the limbs.

Deafness.

As a rule, the patient is stone-deaf and often dumb as well and there may be associated symptoms, such as loss of vibration sense in the bones of the skull. The patient is told in writing that he will be cured in five minutes by electricity. The suggestive effect may be enhanced by the use of a darkened room, a head mirror, and so forth, but the essential treatment consists in applying a strong faradic current to the side of the head or to the external auditory meatus. The patient is informed that as the feeling comes back the current will appear more and more painful, and that in a very short time he will be able to hear the tick of a watch pressed against his ear. The current is applied for a few seconds at a time and increased in strength between each application. When the patient begins to show signs that the current is painful he is told that the feeling is returning and that he will soon hear perfectly. A watch (or a tuning-fork) is pressed closely against his ear between each application of the current and in less than five minutes he will begin to hear it. After a few more applications of the current he will be able to hear the watch at a distance of a foot or more. Sometimes he is able to hear the ticking of a watch, but is unable to interpret what is said to him. He is then re-educated, beginning with the vowel sounds, then with words of one syllable, then two, and so on, until he can hear perfectly. If the other ear has not recovered at the same time it is a simple process to restore the hearing to it in the same way. The cure is usually complete in less than ten minutes, though it may take longer in patients who have been stone-deaf for a year or more. In a series of 34 cases we have had only one failure. This was in a patient who had been deaf for over a year in spite of every kind of treatment. We saw him for a few minutes only and had no opportunity of continuing the treatment.

We have yet to observe any of the unpleasant after-effects which are said to arise from faradism in the region of the ear. It may produce a transient vertigo, and if it is to be effective it must be strong enough to be painful. The patient may object to this at first, but when the hearing has been restored to one ear he is always perfectly ready to have the same process applied to the ear which is still deaf.

One has sometimes to deal with cases where faradism has failed to produce a cure, The failure is due to lack of determination on the part of the operator; he is either ignorant of the fact that the condition is one which always responds to suggestive measures, or he becomes too easily fatigued to see the thing through to a successful issue. In such cases some other suggestive measure must be adopted; for instance, the application of tuning-forks of different sizes, beginning with those in which the vibrations are slow enough to be felt rather than heard, and reducing the size gradually until the fork can be heard rather than felt. The re-education can then be completed by shouting down a stethoscope. However, in untreated cases we have found the electrical method to be invariably successful in a few minutes.

Mutism.

When this is complicated by deafness it is, of course, natural to treat the deafness first, as this makes communication with the patient so much easier. As soon as he can hear the patient is told that his speech will be restored in the same way. A long pharyngeal electrode is used, and he is told to sound the vowel "ah" as soon as he feels the current. The soft palate and pillars of the fauces are stimulated, and as a rule he phonates loudly as soon as the electrode is applied; he is then told to repeat the other vowels, the letters of the alphabet, numbers, days of the week, &c., and he is soon able to enter into a conversation.

When mutism has existed alone it is often unnecessary to do anything more than tickling the back of the patient's mouth with a mirror or tongue depressor. This evokes some reflex phonation in the form of gurgling or retching, and the patient is then told to say "Ah." The process is repeated until he can do this naturally, and it is then a simple matter to make him sound the other vowels and to repeat the whole alphabet in an audible voice. In still milder cases the patient will phonate loudly when he coughs or gargles, and he can then be made to sound "ah" by gradually eliminating the explosive element of the cough. In some cases the soft palate appears to be anæsthetic, and the patient does not phonate when his throat is tickled. This difficulty can be overcome by applying a faradic current to the back of the throat. In a case which has been previously treated with electricity in this way some new form of treatment must be devised and every effort must be made to strengthen the suggestive effect. However, the condition is one which tends to clear up spontaneously, and most cases respond at once to the simplest suggestions.

The first signs of voluntary phonation must be followed up immediately, and the patient must be given no respite until he can speak perfectly. He is, of course, instructed beforehand that the treatment will effect a complete cure, and he must not be allowed to go back to the ward whispering or stammering, even though he may regard this as an immense improvement on his former state.

Aphonia.

The patient is able to whisper, but cannot phonate properly. This may exist as a stage in the spontaneous recovery of a mute, but it is most often an after-effect of laryngitis. The patient can be made to phonate by tickling his throat or by coughing or gargling, and the whole process is simply one of re-education, which is usually complete in a minute or less. It is rarely necessary to use electricity.

Stammering.

A tendency to stammer sometimes shows itself during the re-education of a mute. It can be checked at once by re-education and simple suggestive measures, such as faradism applied to the back of the neck, but if it is not checked as soon as it appears it may become much more intractable. For this reason patients who have been allowed to recover their voice spontaneously may develop a bad stammer which takes some time to clear up.

Blindness.

We have no direct experience of hysterical blindness in both eyes in military cases. Cases of monocular blindness or of defective vision, with no refractive error and no changes in the retina, are probably more often the result of malingering than of hysteria. Treatment by strong faradism in the region of the supra- or infra-orbital nerves is successful in either case, but it is generally found that the alleged defect can be remedied by a little plain speaking.

Hysterical affections of the other special senses and of the cranial nerves are relatively unimportant, and there is usually no difficulty in devising a suitable form of suggestive treatment.

Paralysis of the Upper Limbs.

Cases of paralysis of one arm are very common and very easily curable. As a rule they occur after some slight wound or bruise which has necessitated the use of a splint. The treatment can best be described by considering a typical case. The patient has received a slight wound of the forearm some months ago, and ever since his whole arm has been useless. He can move it slightly at the shoulder by exerting what appears to be a superhuman effort, and he can occasionally flex the fingers through a small angle. There is complete anæsthesia of the hand and arm, ending in a line drawn horizontally round the elbow. The patient does not necessarily complain of this anæsthesia and there may be no sign of its existence until it is suggested to him by the physician, but it is often useful to elicit it in view of the subsequent treatment. The diagnosis is obvious at once from the absence of wasting, the distribution of the sensory loss, and the involvement of the whole arm after an injury which could not possibly have affected the upper arm and shoulder.

The patient is told that he is very lucky to have come off with such a slight injury, and that his arm will be set right in five minutes by the application of a special form of electricity. He is made to sit on a large pad electrode connected with an induction coil, the other terminal being connected with a wire brush. He is informed that the first effect of the current will be to bring back the feeling in the forearm, and that as the feeling returns the power will return with it. A fairly strong current is turned on, and the wire brush is drawn downwards over the forearm from the elbow to the wrist. After a few applications the patient is told that he can now feel as far down as the wrist, and he is tested with a pin to convince him of the truth of this. If he cannot feel the pin-prick, the current is increased in strength until he can do so. The same process is applied to the hand until this, too, ceases to be anæsthetic. The improvement is pointed out to the patient and he is told that as the feeling has now returned to his arm it will be a very simple matter to restore the power of movement.[4] After a few touches with the electrode designed to produce contraction in the muscles he is told to move the arm. He will do so at first in a hesitating manner with every appearance of great effort, but this will be quite enough to convince him that the power is really returning. The rapid re-education follows at once. He is given no time to think, but urged to move the arm more and more strongly, to grip the physician's hand, to flex and extend the elbow, &c., and the pressure is not relaxed until the whole limb has returned to its normal vigour. If the improvement comes to a standstill before recovery is complete, the faradisation is repeated with stronger and stronger currents. Rapidity and an air of authority which will brook no denial are usually quite enough without this, and if once the recovery is complete there will be little fear of a relapse. If the patient's manner suggests that he is likely to relapse as soon as he leaves the hospital, he is told that this is very unlikely, but that if it should occur he should report sick at once and come back for treatment with a current far stronger than that already used. Needless to say it is rarely necessary to carry out this proposal.

In untreated cases a very mild current is all that is required, but if, as often happens, the patient has been treated before with some form of electricity without suggestion it is better to begin with a current strong enough to be painful. If this has already been tried without success, it is better to adopt some entirely different line of treatment, as in the case of the officer already quoted.

Paralysis of the Lower Limbs.

Cases of monoplegia are treated in the same way as paralysis of one arm. In paraplegia the treatment depends to some extent on the type of paralysis. As a rule, a recent case of paraplegia due to "shell shock" or burial belongs to the flaccid type without exaggerated reflexes. If this is allowed to recover slowly it merges into the spastic variety with pseudo-clonus, exaggerated knee-jerks, and rigidity. Passive movements are resisted strongly, and when the patient attempts to put the flexor group of muscles into action the extensor group contracts at the same time and a condition of increased tone and clonus is set up. The condition is, of course, due to a disordered mental process and not to organic diseases in the central nervous system, and we may regard it as akin to the states of negativism which occur in dementia præcox. Whatever the explanation may be, the fact remains that this condition is very often seen in cases which have been badly treated, and in such cases it is often difficult to eradicate completely in a short time. The spastic condition often occurs during the re-educative treatment of a case of flaccid paraplegia, but it is then of little consequence, as the patient is allowed no time to acquire the habit.

In cases of flaccid paraplegia it is as well to restore sensation and movement to the limbs by treatment with faradism before the re-education is attempted. Otherwise the patient will simply collapse when set on his feet. In the spastic type it is often better to hold the suggestive treatment in reserve and to do as much as possible by re-education alone. The patient is told that all he needs is a little confidence in his legs, and he is then set on his feet and induced to walk. At first the greater part of his weight is taken by the physician, but in a few minutes he is made to bear his own weight and to walk with less and less assistance and more and more rapidly.

Certain details in the treatment deserve mention. It is perhaps unnecessary to insist that slippers without heels are not the ideal form of footgear when the patient is learning to walk. They encourage a shuffling gait, and frequent halts are necessary to readjust them. Indeed, the use of slippers and a stick would perpetuate a limp in any patient who had the least tendency to a neurosis. The re-educative treatment of a patient who cannot walk properly is best carried out in a large empty room, a corridor, or out of doors. He will not feel unduly self-conscious as he would do in a ward full of patients, and he will have nothing to hold on to. If there is no alternative between walking and falling down the patient will usually find himself able to walk (once he has passed the earliest stages in re-education), but if a middle course is offered in the shape of a chair or a bed to which he can cling he will at once seek safety in this, and the more he is allowed to use his hands to support himself the less likely will he be to trust to his legs. At first the patient will seem to be continually on the verge of losing his balance, but, as a rule, there is little fear of this, and the idea should not be encouraged by supporting him whenever he seems in the slightest danger of falling. It is best to allow him as little assistance as possible. To begin with he should walk arm-in-arm with the physician, then facing him and holding his hands, then holding one hand only, and finally with no support at all. A fall should be avoided as far as possible, but it is of no great consequence if it does occur, for the patient will not be taken unawares, and will be unlikely to hurt himself. A fall should on no account be taken as an excuse for resting; it should be treated as a matter of course, and the patient should be made to continue his efforts until he can walk without falling.

If possible the patient should not be returned to the ward until he can walk without assistance of any kind, and on no account should he be allowed to use sticks or crutches, even though he has been paraplegic for six months. Until he has recovered completely he should not be allowed to walk except under the direct supervision of the physician; otherwise he will be liable to develop a functional gait or a limp, and a further re-education will be necessary. As in every functional disorder, it is extremely important to produce a rapid improvement during the first treatment and to continue this at the earliest possible moment until recovery is complete.

Precisely the same form of treatment applies to the patient with functional "rheumatism," who walks with bent and trembling knees and a couple of sticks, functional hemiplegia, functional sciatica, and functional gaits of all kinds. As a rule it is found that the more serious the disability the easier will it be to cure; a case of complete

[4] The layman seems to consider that loss of power and loss of feeling are inseparably connected. One of us asked 100 persons of average intelligence whether they would lose the sensation in their hand if for any reason it became paralysed. Due care was taken to avoid suggesting the answer, but in every case they replied in the affirmative. This idea may account for the development of anæsthesia in functional paralysis, and it is easy to see that a patient will accept the suggestion that his paralysis will recover when his anæsthesia has been cleared up by electricity.

flaccid paraplegia will often walk perfectly after an hour's treatment, whereas a man with a slight functional limp will need a re-education lasting for days or even weeks.

Tremors, Fits, &c.

We have given a detailed account of the treatment of deafness, mutism, and paralysis because these cases are so easily curable with rapid suggestive and re-educative measures. They are all due to the absence or diminished activity of a normal function, and the treatment has only to recall this function to the patient's consciousness. Fortunately these cases form a large percentage of the hysterical war neuroses. There is, however, a group of cases in which the treatment is often successful, but by no means invariably. These cases depend not so much on the absence of a normal function as on its excessive and disordered activity. Functional tremors and incoördination, choreiform movements, and tic-like spasms are examples of this class, and we might include hysterical fits and even the stammering and explosive type of speech. Functional tremors are sometimes very easily cured by a little suggestive faradism, and fits may be stopped temporarily at least by suggestive measures. The patient is induced to have a fit by assuring him that he will do so when an electric current is applied to his forehead, and the fit is checked by supraorbital pressure or faradism to some other part of the body. The patient is then told that his fits are not epileptic and that they have been cured. As a rule he will have no more fits as long as he is in hospital, but he may relapse outside, and we know of several cases where this has happened. Indeed, the method is probably more valuable as an aid to diagnosis than to treatment.

Involuntary movements and hysterical chorea may yield to rapid suggestive methods, but isolation is a more reliable form of treatment, although it is at the best a slow process.

Functional contractures deserve a place by themselves. When they are truly hysterical they will usually yield at once to suggestive faradism with a moderately strong current. But it is sometimes extremely difficult to make certain that the condition has not some organic basis. Babinski and Froment have collected a number of cases described as reflex nervous disorders and having an organic origin, although they show a superficial resemblance to the hysterical contractures.[5] These cases are generally intractable, and so far no line of treatment has been found to have much effect on them. We have seen four or five cases which could be included in this category, and in them suggestive treatment was certainly quite ineffective.

For the sake of completeness we should mention a method of suggestion which is often employed with good results. This consists in anæsthetising the patient and making the necessary suggestions to him as he is going under or coming round from the anæsthetic. To a certain extent the process may be compared with hypnotism in that the suggestions are made at a time when the critical faculties of the patient are dulled; but the main advantage of the method lies in the fact that in the stage of excitement the patient will struggle, cry out, &c., and that he will often regain consciousness whilst he is in the act of moving the arm which was formerly paralysed or using the voice which was formerly dumb. The method demands an anæsthetist who will be able to produce a long excitement stage, and the results are to some extent a matter of luck. This furnishes the chief objection to the method, for if it fails the patient will have some excuse for taking a gloomy view of his case, and he will be naturally sceptical of less heroic methods. However, we have little direct experience of the method, as we have not found it necessary to employ it.

Prognosis and After-treatment.

The treatment of a functional case does not end at the moment when the disability has been cured, and we have always to determine how much the patient may be safely called upon to do without fear of a relapse. This will depend on how far the underlying mental condition is a permanent state and how great a strain was necessary to lead to the development of the symptoms. If the patient gives a history showing pronounced mental instability or previous functional troubles before the war, and if he has lost the use of his legs after a few days in the trenches, it is clear that he will never be of the least value at the front, and he is probably best employed in a labour unit at home or on sedentary work. If he has served several months in the fighting line, and has then lost his voice after a week without sleep and a severe bombardment, he will often be perfectly fit again after a short rest, and he will show only the slightest signs of the hysterical temperament. He may relapse under an equally severe strain, but if his cure has been rapid and complete on the first occasion he will have less reason to fear a relapse and to regard a temporary loss of speech as a serious and intractable condition. It is another matter if he has been allowed to remain dumb for six months in hospital, for in this case he will have every reason to regard himself as the victim of a severe form of "shell shock," and he will probably be quite unfit for service in the fighting line.

In all cases a thorough examination of the past history and mental condition must be made before we can decide what form of service will be most advantageous to the patient and to the nation. In the more intractable conditions—tics, convulsions, &c.—the patient may be able to do some useful work with a labour unit, but it is often better for all concerned to return him to civilian life.

In conclusion, we wish to express our thanks to the medical and surgical staff of the National Hospital, Queen-square, and to Lieutenant-Colonel W. Turner, officer in charge of the Connaught Hospital, Aldershot, for permission to publish these notes.

[5] Babinski et Froment: Hystérie-Pithiatisme et Troubles Nerveux d'Ordre Réflexe. Masson et Cie. 1917.

CHYLO-HÆMOTHORAX FROM WOUNDS INVOLVING THE THORACIC DUCT.

BY T. R. ELLIOTT, F.R.C.P. LOND., F.R.S.,
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AND
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WHEN a fluid obtained by exploratory puncture of the chest seems to be "frankly purulent" to the naked eye one is apt to assume that this appearance is sufficient proof that an empyema is present and that rib resection is justified without any further microscopic study of the specimen.

In nearly all such cases the presumption that infection exists is true, but occasionally a rare example may be encountered in which the thoracic duct has been wounded in the chest without the associated injuries being at once fatal, and then the milky chyle will leak into the effused blood and produce a combination mimicking that of a pyo-hæmothorax so closely that most surgeons would be deceived by it.

The first case quoted in this paper was one in which the error was not avoided and the medical officer was misled by the appearance of the fluid into performing an operation for drainage of the pleural cavity. The patient recovered, but his convalescence was dated by months instead of by weeks in consequence of the mistake. In the second case the character of the fluid was guessed to be chylous and proved to be so before anything was done. But unfortunately the effusion had been infected by the shell fragment which caused the wound and drainage was unavoidable and was followed by death.

The error can only be avoided by holding fast at all times to the general clinical rule: "That *drainage* of a chest after gunshot wound should never be undertaken except upon bacteriological proof of infection in the fluid withdrawn at exploration, or upon the recognition of an offensive smell in the latter." The naked-eye appearance of any fluid may be entirely misleading, as hopelessly, though not so frequently, as is the clinical judgment of a chest wound before exploration is made.

At base hospitals these cases of chylo-hæmothorax must be very few. The two that are described from our own experience did actually occur in the same hospital within a month of one another, but they are the only two that we have seen out of a total of 600 samples of hæmothorax fluid that were examined by us in the laboratory; and this laboratory figure covers a clinical experience of far more than a thousand chest wounds. But the occurrence of a chylous effusion would not appear to be so rare as this, if it were expressed as a percentage of all large effusions on the

left side of the chest. The possibility is certainly a practical point which deserves to be borne in mind when dealing with big traumatic effusions in the left pleural cavity.

Diagnosis.

There are several points which characterise a chylous leak into a hæmothorax.

1. The collection of fluid is on the left side.

2. The effusion continues to increase steadily and rapidly on the third and fourth day, causing progressive cardiac and respiratory embarrassment. Such an increase is rarely seen with an ordinary sterile hæmothorax, where the bleeding is either fatal or ceases in the first 24 hours. It may, however, occur as the result of infection of a hæmothorax. A chylous effusion, even if infected, will not be accompanied by high fever because the patient's nutrition is profoundly impaired; whereas sepsis in a simple hæmothorax generally causes a high temperature.

3. Exploration discovers a fluid which appears to be heavily loaded with pus. If this appearance is seen in a large collection of fluid early in the first week after the wound, it is almost certain that it must not be ascribed to pus, because the processes of pleural suppuration following upon sepsis in a hæmothorax take many days before they can produce an abundant pleural exudate.

4. The fluid is opaque, and its colour will vary from red to pink or creamy-grey in accordance with the proportion of commingled blood. In the two cases that are described below the fluid did not clot after withdrawal from the chest, presumably because its fibrin was being separated by coagulation within the chest as fast as the chyle escaped from the duct.

5. On centrifugalisation a deposit of red cells is thrown down, leaving a supernatant opaque milky fluid whose creamy-white colour contrasts brilliantly with the red band below. Under the microscope the milky fluid is seen to be filled with small fat globules, which are immediately soluble in ether. A few mononuclear leucocytes are scattered among these fat globules.

Anatomy of the Lesion.

The cervical part of the thoracic duct, or one of its branches, has occasionally chanced to be injured in the surgical operations of civil life when extensive dissections are being made in the root of the neck. The records of such cases have been fully collected in a recent paper by E. Harrison.[1]

The intra-thoracic portion of the duct lies in a field that is less exposed to surgery, and its lesions in civil life are for the most part those of spontaneous rupture, which may occur when the duct is obstructed by the pressure of a malignant growth or by the chronic fibrosing inflammation due to filaria parasites. In such cases a collateral circulation is often fairly well developed before the rupture occurs, because the obstruction is slow in being established; and therefore the clinical picture differs from that caused by a wound suddenly severing a healthy duct which was the sole conduit for chyle from the visceral area to the venous system.

In the wounds of war-time the duct is no doubt often torn open by missiles that injure the chest; but its position is so closely related to that of the great vital vessels of the thorax that the bullet which can wound the duct is almost certain to kill by causing fatal hæmorrhage from the neighbouring blood-vessels.

Below the level of the fourth thoracic vertebra the duct is a target which a missile cannot reach without injuring in addition either the heart, the aorta, or the azygos veins. Above this level the duct passes outwards to the left, and it may take a path over the heads of the first three ribs or be displaced even further laterally. In this position the left mediastinal pleura comes into lateral or anterior relationship with it, while the origin of the left subclavian artery is immediately to the front. Here a ball may chance to pass between the vessels springing from the arch of the aorta and to cut the duct without injuring the great veins at the root of the neck.

The possible paths for such an injury may, perhaps, be several in number; but as a matter of experience, in each of the two cases quoted in this paper the track of the missile seems to have been the same, passing obliquely across the apex of the thorax, behind and under the subclavian artery and meeting the duct as it lay near the apex of the lung upon the vertebræ, or perhaps upon the heads of the ribs. This track is roughly parallel to the axis of the heart. It will permit the passage of a large projectile, such as a shrapnel ball, without associated fatal injuries. In our second case it appears likely that the shrapnel ball entering above the right clavicle had attained this path by passing through and splintering the body of a vertebra. It is a common and, indeed, it is the usual occurrence, for a missile to pass from side to side through the centrum of a vertebra without causing any symptoms of injury to the spinal cord. In the case of a double non-fatal hæmothorax, this is the path usually taken by the projectile concerned when it crosses in the upper two-thirds of the chest.

Treatment.

An intrathoracic wound of the duct is beyond the present skill of surgery for its repair. Case 1 shows that the fistula may close spontaneously in a few days. Increase of intrapleural pressure probably has some value in stopping the leak, for the chyle in the duct does not exert a high pressure, and therefore the volume of the effusion should be lessened by aspiration only when it is causing distress to the patient.

It is desirable that the prone position should be maintained in order to keep clots in contact with the apex of the chest. Fats in the food will increase the flow of chyle, but they will also help to give substance to any clot that may form. Whatever decision may be taken with regard to giving or withholding fats from the dietary, it is at any rate certain that they do not reach the patient's tissues so long as there is a complete leak from the duct, and therefore the sugars in the food must be increased in the attempt to maintain nutrition.

Case 2 was an example of a complete leak. Although the pleural cavity was infected, the patient showed a subnormal temperature that was below the limit of the thermometer, 95·4° F., every morning on the last eight days of his life, while it was continually subnormal on the last three days before that on which he died. His body wasted away with extraordinary rapidity. He did not suffer from the hunger or from the intense thirst that has been described by other observers as being so conspicuous in cervical cases, where the patient survived with a leak for a longer period. Very notable in this case were the huge masses of curdy yellow clot that progressively filled the pleural cavity as the fluid part of the effusion was daily drained away. These formed so large a deposit as to give the impression that had the effusion been sterile, and had the patient survived owing to a spontaneous closure of the fistula, it would have become necessary later to open the thorax and remove the clot in order to give the lung a chance of expanding.

We are indebted to the various medical officers concerned for their kind permission to publish these clinical histories of cases that were directly under their care.

CASE 1.—Sergeant P. August 8th, 1916: Wounded by shrapnel ball, which entered the chest immediately above the outer third of the right clavicle and lodged under the skin at the very apex of the left axilla near the posterior axillary fold. No hæmoptysis. No vomiting or difficulty with swallowing. Eighteen hours after this injury the patient walked a mile, and there was no suggestion of any damage to the spinal cord, though the right brachial plexus was slightly injured.

Fourth day: Subcutaneous emphysema of left side. Signs of small left effusion. Sixth day: Patient was sweating, cyanotic, and distressed; temperature swinging between 99° and 100° F. The effusion in the left chest had increased rapidly in the last two days, and in consequence of this accumulation the medical officer in charge suspected sepsis. Seventh day: Chest explored. A pink, opaque, creamy fluid was obtained, the character of which led to its being regarded on naked-eye evidence as undoubtedly purulent. Rib resection was at once performed. Much blood clot and a large quantity of apparently purulent fluid, estimated at about 80 ounces, were removed. Meantime the microscope had shown the exploration sample to consist only of blood and chyle, which separated on standing into a clean deposit of red cells below an opaque, creamy yellow fluid. Cultures subsequently proved this fluid to be completely sterile.

Eighth day: The resection wound was now completely closed by the surgeon in the hope that infection had not been introduced. Eleventh day: Physical signs of a large pneumothorax with complete collapse of left lung. Explored at left base; purulent fluid containing streptococci and a Gram-positive diphtheroid was found. The chest was opened again, air-tight drainage with a collecting flask being at first employed. The pleural fluid received in this flask was now simply purulent, and the leakage of chyle had completely ceased. The drainage at first was not satisfactorily arranged and the lung failed to expand well. Thirtieth day: Transferred to England. Still a very large empyema cavity, but patient was in good condition and had not lost flesh despite the heavy secondary infections that had been implanted on the originally sterile pleura.

The subsequent history was not fully ascertained, but ten weeks after the wound the patient was reported to be doing well.

[1] British Journal of Surgery, 1916, iv., 304.

CASE 2.—Sept. 15th, 1916: Wounded by fragment of shell which entered in the middle of the throat immediately below the thyroid cartilage. No exit wound. Fourth day: Admitted to base hospital. When seen a few hours later he was extremely ill and of a grey cyanotic tint. Temperature 97·4° F.; pulse 120 and weak. Heart displaced out to right nipple, and physical signs of complete pneumo-hæmothorax on the left side. From the general appearance of the patient at this early date, and from the absence of fever, it was thought to be most probable that the condition was that of a simple air leak and not of a gas pneumothorax caused by infection. The chest was aspirated on the same day by Captain Thatcher, R.A.M.C., who withdrew 90 ounces of grumous grey fluid, the appearance of which at first suggested that it might have come either from the stomach or from the thoracic duct. There was no offensive odour and litmus paper proved the fluid to be alkaline. After standing in a test-tube a small deposit of blood cells fell out as a red band at the bottom, leaving a greyish-yellow, opaque fluid above. Microscopically the fluid was found to be chyle, with an excessive number of polymorphonuclear cells in the deposit and a few Gram-positive bacilli. Its appearance on first withdrawal and before the separation of the red cells by standing was very like that of an ordinary empyema fluid, though there was just enough difference in tint to raise a suspicion, in view of the experience from the preceding case, of its having been derived from some abnormal source.

Fifth day: Bacteriological culture from the fluid discovered a streptococcus as well as *B. perfringens*. The patient was still very cyanosed and another 40 ounces of fluid similar to that of the preceding day were removed by aspiration. In the evening part of a rib was resected. More of the same fluid was found and the surgeon met with a yellow clotted mass in the pleural cavity which he thought to be prolapsed omentum and hastily replaced. Actually this mass was clotted chyle, which ought to have been removed.

Eighth day: Patient said that he felt worse. He was wasting with great rapidity and looked marasmic rather than septic. Pulse very feeble, 104; extremities cold, and temperature remaining deeply subnormal, below 95·4°. There was a slight cyanotic flush on his cheeks. The patient's bed was almost soaked in chyle, which continued to pour abundantly from the drainage-tube in his left side in the intervals when it was not blocked by yellow masses of clot that had a slightly rancid but otherwise inoffensive smell. He was drinking freely but without notable thirst, and had no appetite, though taking sugar and bananas fairly well. There had been no difficulty in swallowing at any time, and there was no hæmoptysis after the first day.

Ninth day: Heart still displaced to the right nipple, and still some cyanosis, while there was now a considerable amount of purulent sputum. In the hope of relieving the cardiac embarrassment a large drainage-tube was used with a big rubber flap which was cemented on to the chest wall by a solution of dental rubber dissolved in chloroform. This gave an air-tight junction and suction was then applied by means of an automatic aspirating bottle, the drainage products being collected in an intermediate receiving flask. This saved the patient from the exhaustion which had been caused by the need for frequent redressing when the chyle was allowed to leak out freely into the bed, and a large quantity of fluid was collected within the next 24 hours. But the apparatus failed to expand the lung because the tube was continually being blocked by masses of coagulated chyle.

Eleventh day: Patient had steadily been growing weaker and he died quietly. On this last day the temperature, which for the three preceding days had been below 95·4°, rose to 97°.

The autopsy showed as follows. Entry wound: A small healed scar in the neck to the right of the middle line just below the level of the cricoid. Beneath this lay a small collection of pus which had caused superficial necrosis of several of the cartilaginous rings of the trachea. The missile had entered the trachea and passed out from it again through a wound on the left side a little lower down. Both of the wounds were septic but practically closed.

The track then ran behind the main vessels entering the neck, and perforated the pleural sac about 1½ inches from its apex. The small piece of shell was found loose in the pleural sac, a position which it had reached after passing posteriorly through the upper lobe of the left lung and tearing a track along the upper surface of the lower lobe. The wound of the thoracic duct could not be found, but the track of the missile proved that this wound must have been in some position near the apex of the thorax that was surgically inaccessible.

The pleural cavity was filled with great masses of sour-smelling clot that resembled buttery yellow curds, and were very light to handle. The clots contained innumerable large cavities, spaced like those of a Gruyère cheese, each of which held inoffensive gas and a little fluid smelling of butyric acid. There was no appearance of pus to be found, nor any unpleasant odour suggesting the ordinary proteolytic products of a gas bacillus infection.

The left lung was completely collapsed and showed the wound track described above. It had not re-expanded at all after rib resection, presumably because the drainage had been interfered with by the accumulated masses of clot. The heart still remained in a position of extreme displacement to the right; there was no pericarditis. Bronchitis was evident in the right lung, but there were no areas of collapse.

Inoffensive gas (hydrogen and carbon dioxide) and simple organic acids are the ordinary products of the growth of pure *B. perfringens* on carbohydrates. No satisfactory analysis has yet been made by pathological chemists to show whether *B. perfringens* can effect the decomposition of fats, so that we are perforce content to record the changes observed in this clotted chyle without attempting any further explanation of them.

DONATIONS AND BEQUESTS.—By the will of the late Miss Emily H. Mortimer the Royal Isle of Wight Infirmary at Ryde and the Royal National Hospital for Consumption, Ventnor, will each receive £1000.—The late Mr. W. H. Sidley, whose estate has been valued at £16,000, left such sum as may be necessary for the endowment of a bed in the General Hospital, Birmingham, and the residue of his estate in equal shares to the Queen's Hospital and the General Hospital, Birmingham.

THE MENACE OF MORPHINE TO CHINA.[1]

BY WU LIEN-TEH (G. L. TUCK), M.D. CANTAB.,
PRESIDENT OF THE CHINESE NATIONAL MEDICAL ASSOCIATION.

THE year 1917 will be historic as the one in which opium, the curse of China for 75 years, will be officially and finally banished from the country, for in this year the ten-year agreement made between Great Britain and China regarding its importation into China, including the last two seaports of Shanghai and Canton, will come to an end, so that even in the British Settlement of Shanghai the remaining opium shop will be closed by the month of March. The whole nation will rejoice at this happy termination of an awful vice, which once looked as if it might exterminate the Chinese race. That the drug is scarce may be ascertained by the fact that the present price in Canton is at least $15 per tael, with a tendency to rise. Except for some smuggling from Turkestan and Russia by way of Siberia very little opium will in future find its way into China, though the Government and Customs authorities will still have to exercise, in dealing with this enormously paying business, the greatest vigilance over unscrupulous people.

Morphine Statistics: British and Japanese Traders in Morphine.

I am afraid we cannot be so sanguine with regard to morphine, for up to the end of last year all statistics point to increased importation into China. The supply of morphine comes mainly from two firms in Edinburgh and one firm in London. The following table shows the declared exports of morphine from Great Britain alone:—

1912	.....	276,572 ounces,	equal in weight	to	7¼ tons.
1913	.....	406,154 ,,	,,	,,	11¼ ,,
1914	.....	504,020 ,,	,,	,,	14 ,,

It is estimated that the exports in the years 1915 and 1916 are at least 600,000 ounces for each year, equal to over 16 tons. Moreover, the normal importation of opium into Japan for medicinal purposes is only 10 chests a year, but the importation of morphine into that country in 1911 was 1¼ tons; in 1914 this had risen to 12 tons—that is, 1 ton a month. There is a large firm in Japan which acts as agent for the manufacturing firm in London. In 1913 alone this agent in Japan imported 2¼ tons of morphine by *registered post* via Siberia. The two other British firms exported 2 tons by the same method, and 1¼ tons came from Germany, making a total of 6¼ tons in 1913. So far it has been ascertained that neither Japan nor Germany has got the necessary plant to manufacture morphine on any large scale, and the alkaloid has come mostly from firms in Great Britain. Once arrived in Japan the morphine is usually made up into small packets or placed into small bottles, labelled in different ways—e.g., morphine, "white powder," "soothing stuff," "dreamland elixir," &c., and exported openly or smuggled secretly into China by way of Dalny, Antung, and Formosa. Almost every Japanese drug dealer or pedlar in Manchuria sells it in one form or another, and does so with impunity, because no Japanese can be arrested without complaint being first lodged at the Consulate. From these Japanese agents and sub-agents the drug may be passed on to disreputable Chinese who frequent the coolie depôts and inject a solution, usually very dirty, with a hypodermic syringe which may be made with glass, metal, or even bamboo. Rigorous imprisonment for two years is a common sentence for Chinese found with morphine in their possession, but the principal culprits often escape punishment.

The morphine habit was first brought into China by returned Swatow emigrants from Singapore and spread to other parts of Fukien. During my five years residence in Manchuria I have seen terrible havoc wrought upon the population by this drug. More than half of our regular jail-birds there show needle signs over their bodies, professional beggars found in the streets of Harbin, Kirin, Changchun, and Tsitsihar are victims of the habit, and thousands of poor people die in the large cities during the winter months, partly from cold but principally from inability to work on account of their morphine habits. From all sources I learn that the evil is spreading rapidly, and it is worse than opium

[1] A paper read before the Joint Medical Conference, Canton, January, 1917.

smoking. Enormous profits are made by the dealers in this illicit trade. The average wholesale price of morphine hydrochlorate in London is 10*s.* 5*d.* per ounce, but the Japanese pedlars sell it in China for £4 10*s.* to £5.

The profits made on 6½ tons by the dealers in China in 1913 amounted to £840,000. Unless strong action is taken by our profession, as was done by us in the case of opium, the morphine evil will assuredly spread farther and render futile all our efforts in the direction of opium eradication. The question is, "What are we to do?"

The Hague Conventions with Regard to Opium, Morphine, Cocaine, and Allied Drugs.

Three Opium Conferences have already been held at the Hague—in 1911–12, 1913, and 1914. At the first a Convention was drawn up in which all the participating Powers (Great Britain, United States, China, France, Germany, Italy, Japan, the Netherlands, Persia, Portugal, Russia, and Siam) agreed to help one another mutually in restricting the evil effects of opium, morphine, cocaine, and allied drugs. At the Second Conference 44 out of 46 Powers of the world had already agreed to append their signatures to the Convention, and at the Third Conference the United States, the Netherlands, and China deposited their ratifications so as to act forthwith upon the articles of the Convention. Although the representatives of Great Britain were instructed at the Second Conference to declare on behalf of their Government their readiness to ratify, the matter has so far been delayed. In the meantime the war has put a stop to many things, but morphine continues to find its way into China. Two articles in the Convention signed on Jan. 23rd, 1912, deal particularly with morphine and allied alkaloids. These are:—

Art. 9.—The Contracting Powers will enact pharmacy laws and regulations so as to limit the manufacture, sale, and use of morphine, cocaine, and their respective salts to medical and legitimate uses only, unless such laws already exist. They will coöperate among themselves in order to prevent the use of these drugs for any other purpose.

Art. 14.—The Contracting Powers will apply the laws and regulations for the manufacture, import, sale, or export of morphine, cocaine, and their respective salts to (*a*) medicinal opium, (*b*) to all preparations (official and non-official, including the so-called anti-opium remedies) containing more than 0·2 per cent. of morphine or more than 0·1 per cent. of cocaine, (*c*) to heroin, its salts and preparations, containing more than 0·1 per cent. of heroin, (*d*) to every new derivative of morphine, cocaine, or their respective salts, or to any alkaloid of opium which, as the result of scientific research, shall be generally recognised as giving rise to analogous abuse or producing the same injurious effects.

If these articles had been put into operation, along with the rest of the machinery provided in the Convention, a great deal would have been done towards controlling the production and distribution of drugs of addiction throughout the world and restricting them to use for medicinal and legitimate purposes only. As it was, the war came on, and both Great Britain and France were obliged to introduce severe laws against the illicit use of morphine and cocaine by the armies and inhabitants of the warring regions. A recent Government Order announces the entire prohibition of the importation of opium into Great Britain except with the sanction of the Government. It is to be hoped that this will result in the limited manufacture of morphine so that as little as possible of this harmful alkaloid may find its way out of the country.

If proper pharmacy laws are enacted in China the problem of morphine eradication will be really an easy matter. Unlike opium, it has never been declared as an article of commerce, and our Government has always regarded it as a prohibited drug. Once Great Britain refuses to sanction its export, except directly to friendly Governments or legally qualified agencies, the question of smuggling will not be such a serious affair.

The Procedure Recommended.

The Customs laws regarding the importation of morphine and hypodermic needles into China are somewhat crude and inflict much hardship upon qualified medical men and apothecaries. One meets, for instance, with the following Customs Regulation (No. 693):—

On and after the 1st Dec., 1910, the manufacture in China by Chinese and foreigners of cocaine, morphia, and of syringes, needles, and such-like instruments for its use, is absolutely prohibited; and the importation of the same into China by Chinese and foreigners is likewise prohibited—except in the case of *duly qualified foreign medical practitioners*, foreign chemists and druggists, civil hospitals established by Government in any province, military and naval surgeons, and medical colleges of any kind complying with the following conditions, &c.

If taken literally—and it is often thus done—a Chinese medical man, however well qualified from Europe, America, or Japan, will be unable to use morphine or cocaine for the most humane purposes. Again, a hypodermic syringe is regarded by the Customs as an instrument solely for the illegal use of such drugs, and no Chinese medical man is able to procure it for the injection of emetine, pituitrin, or any of the new drugs. As matters remain at present, the culprits escape, for they can evade the laws by not declaring properly, whilst bona-fide practitioners and qualified apothecaries have to undergo all sorts of difficulties in this connexion.

I would suggest that this Conference pass some resolutions—

(1) Drawing the attention of the Government to the menace of morphine in China and the importance of taking immediate steps against its illegal use by cutting off the supply from the source.

(2) Asking the Government to enact without delay proper pharmacy laws to regulate the position of dispensers and pharmacists in charge of drug shops, the sale of morphine, cocaine, and other deleterious drugs and poisonous chemicals.

The articles of the Hague Opium Convention have amply paved the way for such laws. If requested, our two associations would depute members to render the necessary assistance in drafting the laws. The establishment of a Central Medical Council would facilitate matters immensely.

THE EXPERIMENTAL PRODUCTION OF TUBERCULOUS PERITONITIS IN GUINEA-PIGS PREVIOUSLY EXPOSED TO X RAYS.

BY J. J. McGRATH, M.B. R.U.I., D.P.H.

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THE existence of acid-fast bacilli, other than *B. tuberculosis*, in pathological material frequently necessitates inoculation methods either to confirm or exclude a diagnosis of tuberculous infection. Unfortunately the general utility of such tests is often discounted by the length of time before a definite result can be recorded.

Experience has already impressed upon us the advisability of employing the guinea-pig for inoculation purposes, since the introduction of even a few tubercle bacilli into this animal is followed by a definite sequence of events terminating in death from general tuberculosis at some period near to, or remote from, the date of inoculation (according to number of bacilli injected, type of bacillus—i.e., human or bovine, virulence of strain, site of injection, and other factors), and varying from a few weeks to several months.

The deterrent effect of this time factor which operates so adversely against the universal employment of animal experiment in clinical laboratory diagnosis has stimulated research, having for its object the abbreviation of the "observation period," with hitherto but few tangible improvements on the methods of Villemin.

Recently Morton and Murphy,[1] during the course of observations on the behaviour of transplanted cancer in white mice, noted that repeated exposures to small doses of X rays destroyed the major part of the lymphoid system in these animals without causing any obvious injury to other tissues or exercising any deleterious effect upon the general health. Heineke[2] had already shown that the effect of X rays was first manifested by the destruction of the lymphocytes.

Subsequently Morton[3] found that the same changes occurred in the guinea-pig, and further that one massive dose of X rays produced in this animal the same effect as repeated exposures to small doses. Taking now as a starting-point the assumption that the lymphoid system forms the main defence against infection by *B. tuberculosis*, Morton first exposed his guinea-pig to a massive dose of X rays, then inoculated into the peritoneal cavity material containing the tubercle bacillus, and obtained a tuberculous peritonitis obvious to the naked eye, as well as microscopically, within 14 days.

The importance of these observations, if capable of corroboration, cannot well be over-estimated, and this preliminary note deals with my experiments in this direction.

Normal healthy guinea-pigs of from 200 to 250 grammes in weight were exposed on one occasion only for a period of

[1] Journ. Exper. Med., 1915, xxii., 204.
[2] Mitt. a.d. Grenzgeb. d. Med. u. Chir. 1905.
[3] Journ. Exper. Med., 1916, xxiv., 419.

10 minutes to X rays derived from a Coolidge tube, a current of 5 milliampères backing up a 12½ in. spark. A differential leucocyte count was made of 25 of these animals the day following exposure to the X rays and every second or third day subsequently until the animal died or was killed, in one instance as many as 15 days later. Of these 25 animals a fall took place in the percentage lymphocyte count in 11 only, in 2 it was unaltered, and in 12 it was actually increased. These observations are being repeated.

The guinea-pigs after exposure to the X rays were then inoculated intraperitoneally with sputum or other material rich in acid-fast bacilli, which had all the morphological and tinctorial characters of *B. tuberculosis*. In the early experiments the association of common pyogenic bacteria in the material injected led to several deaths from acute septicæmia due to streptococcus or *B. coli*, but this risk was subsequently overcome by treating with antiformin every specimen that was not microscopically "clean" before injecting it into the guinea-pig.

The results obtained fully confirm Morton's observations, as the six selected examples in Table I. show. From these results it may be assumed that, given inoculum rich in tubercle bacilli, the experimental animal may be destroyed within 14 days with tolerable certainty that macroscopical tuberculous lesions will be found post mortem.

TABLE I.

Material inoculated: Guinea-pigs A, B, C, D, E, 1·0 c.c. sputum crowded with *B. tuberculosis*; F, 1·0 c.c. urinary deposit (catheter specimen).

Guinea-pig.	Result of inoculation of X-rayed G.P.	Post-mortem lesions.	
		Naked eye.	Microscopical.
A	Killed after 16 days.	Spleen enlarged, no tubercles seen. Liver, no tubercles. Mesenteric glands everywhere enlarged, soft and caseous.	T.B. present.
B	Killed after 15 days.	Spleen enlarged, with tubercle present. Tubercles on liver. Mesenteric glands everywhere enlarged, soft, caseous, breaking down easily.	,,
C	Killed after 14 days.	Spleen much enlarged. Tubercles on liver. Mesenteric glands everywhere enlarged, soft and caseous.	,,
D	Killed after 13 days.	Spleen normal. Caseating nodules found on liver. Numerous soft caseating enlarged mesenteric glands.	,,
E	Killed after 11 days.	Tubercles on liver and spleen, latter much enlarged. Mesenteric glands everywhere enlarged, soft and caseous.	,,
F	Killed after 12 days.	Small tubercles on much-enlarged spleen. Mesenteric glands, several enlarged, soft, caseous, easily breaking down.	,,

One of the points elicited by Murphy[4] in his earlier experiments is summarised in the following statement:—

"If the lymphoid system of an adult animal be depleted by exposure to X rays, the animal loses its power of resistance to heterologous tissues, and transplanted tissues are thereby enabled to grow readily within its body."

My own observations on the guinea-pig tend to show that this lack of resistance extends not only to the strangers within the gates—the inoculated tubercle bacilli—but also to its relationship to the external world, and many failures at the commencement of the investigation are to be ascribed to this cause.

As examples may be cited guinea-pig 1, which died within 24 hours from acute *B. coli* peritonitis; the control animal, identical in weight and injected with a similar quantity of sputum, remained alive for three weeks before it succumbed to general tuberculosis. Guinea-pigs 8, 9, 10, 11, 12, 13, all inoculated with the same material, died within 48 hours of acute streptococcic septicæmia. Guinea-pigs 24, 25, 27, and 28 were found dead within a few days of inoculation, in the morning following particularly cold nights in February of this year, whilst similar sized animals in adjacent cages were unaffected.

The earliest date at which naked-eye manifestations can be obtained has not yet been determined exactly, but a number of early deaths followed the inoculation of sputum literally crowded with tubercle bacilli, when no lesions were observed and no tubercle bacilli could be demonstrated microscopically up to the end of five days. (Table II.)

[4] Journ. Exper. Med., 1914, xx., 397.

TABLE II.

Material inoculated: Sputum in each instance.

Guinea-pig.	Result of inoculation of X-rayed G.P.	Post-mortem lesions.		Control.*
		Naked eye.	Microscopical.	
G	Died after 24 hours.	Good deal of fluid in peritoneal cavity.	Films from fluid and heart's blood showed the presence of *B. coli*. No T.B. could be detected.	Died after 21 days.
H	Died 4 days after inoculation.	Nil found.	No T.B. could be detected.	—
J	Died in 5 days.	No lesions found. Suspected to have died as a result of inoculation of antiformin.	No T.B. could be detected.	Died after 19 days.

* *Controls: Post-mortem lesions.*—Naked eye: In both control animals tubercular lesions found in spleen, liver, and mesenteric glands. Microscopical: Films showed T.B., numerous in guinea-pig G.

The most striking examples of early generalisation of *B. tuberculosis* in these X-rayed guinea-pigs are given in Table III. The value of the method must, however, be estimated by a standard of reliability—that is to say, it is not sufficient for the inoculation of material crowded with acid-fast bacilli to give a positive result at an early date; it must be capable of giving evidence of the presence of *B. tuberculosis* even when the material inoculated fails to show the micro-organism after prolonged microscopical examination. Two examples will suffice upon this point. (Table IV.)

TABLE III.

Material inoculated: In each instance 1·0 c.c. sputum crowded with *B. tuberculosis*.

Guinea-pig.	Result of inoculation of X rayed G.P.	Post-mortem lesions.	
		Naked eye.	Microscopical.
K	Died after 7 days.	Pin-point tubercles on spleen and liver. Spleen much enlarged. Mesenteric glands enlarged, soft, and caseous.	T.B. present.
L	,,	Pin-point tubercles found on liver. Numerous enlarged soft caseating glands which easily broke down.	,,
M	,,	Spleen enlarged. Numerous enlarged soft caseating mesenteric glands found.	,,
N	,,	Spleen enlarged. Mesenteric glands everywhere enlarged, soft, and caseating.	,,
O*	,,	Spleen somewhat enlarged. Numerous mesenteric glands enlarged, soft, and readily breaking down.	,,

* X-rayed three days before inoculation.

TABLE IV.

Material inoculated: Guinea-pig P, fæces; Q, catheter specimen of urine.

Guinea-pig.	Clinical diagnosis.	Result of inoculation of X-rayed G.P.	Post-mortem lesions.	
			Naked eye.	Microscopical
P*	Tubercular disease of intestine, ulceration.	Died after 8 days.	Spleen and liver not enlarged. Coils of intestine matted together. Small abscess found between coils of large gut. Mesenteric glands everywhere enlarged and soft.	T.B. present.
Q	Tubercular disease of kidney.	Killed after 12 days.	Tubercle found on spleen. Numerous mesenteric glands enlarged, soft, and caseous. No tubercle on liver.	,,

* X-rayed 3 days before inoculation.

In the fæcal material employed to inoculate guinea-pig P very prolonged search of the centrifugalised deposit after antiform treatment resulted in the detection of one small bunch of acid-fast bacilli; whilst careful search by several observers of the centrifugalised urinary deposit, subsequently injected into guinea-pig Q, failed to show any acid-fast bacilli whatever.

OPERATION FOR LOOSE SEMILUNAR CARTILAGE.

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A GREAT many operations have been performed for loose cartilage during the war, but the recovery of perfect function and fitness for active service has been slow in many cases. Those who supervise the after-treatment by massage, movements, and exercises tell me that they are depressed by the long duration of convalescence and disappointed with the ultimate results in some cases. These facts should lead us to consider whether sufficient care is taken in (1) the selection of cases suitable for operation; (2) the technique of the operation; and (3) the after-treatment.

I. *The Selection of Cases Suitable for Operation.*

It is clearly of the greatest importance to be sure of the diagnosis. Therefore the symptoms, signs, and diagnosis will be briefly discussed here.

Symptoms.—The history of the original and subsequent injuries is of the greatest importance, for the detachment of a semilunar cartilage is nearly always due to *indirect violence* such as a sudden twist of the leg. The internal cartilage is commonly displaced by a sudden outward rotation with abduction of the leg at the knee-joint. Occasionally it is due to extreme flexion of the knee and the sudden attempt to get up. Generally there is a severe pain and often an audible click at the moment of displacement. In many cases the patient feels the cartilage go both out and in. Often the patient has to be carried home or walks painfully on tiptoe, quite unable to fully extend the knee. As a rule, effusion occurs in the first attack. Recurrent displacements are often brought on by more trifling injuries, and later still the cartilage may be displaced by slight movements, such as turning over in bed.

Signs.—When the knee is examined soon after a displacement there may be distinct tenderness over the internal cartilage, and unless the latter has gone back into place the knee cannot be fully extended, and any attempt to do this causes great pain and a tight feeling behind the knee. As a rule, more or less effusion follows for a few days or weeks.

Diagnosis.—It is very important to take pains to exclude other conditions which may simulate loose cartilage, especially osteo-arthritis. An X ray examination often reveals changes in the articular surfaces and in the bones around. There is creaking in the joint, and other joints are commonly affected. Early tuberculosis, especially starting in the synovial membrane near the internal cartilage, is very difficult to distinguish, and radiography does not often help, but the peculiar pulpy character of the swelling with limitation of flexion, the general condition, and the history, are valuable aids in the diagnosis. Laceration of the internal lateral ligament, or partial detachment of it from the femur, may occur at the same time as displacement of the internal semilunar cartilage, but with this condition alone there is distinct local tenderness over the internal surface of the internal condyle of the femur, and sometimes there is an effusion of blood at this spot. In some cases the X ray examination reveals an exostosis near the knee-joint either of the femur or tibia. The slipping of a tendon over one of these may cause symptoms simulating those of a loose cartilage. Also a sprain of the tendons inserted on the inner side of the tibia high up—the sartorius, semitendinosus, or gracilis—may be mistaken for loose cartilage, but the tenderness, creaking, and swelling are lower. Radiography may indicate a new growth near the joint, especially in the centre of the head of the tibia or lower end of the femur. Such a growth may cause much pain and recurrent effusion into the knee-joint as a result of slight strains. The same method of examination may show one or more loose bodies in the joint, generally between the condyles of the femur or in the subcrural pouch of synovial membrane. A sesamoid bone near the gastrocnemius origin has often been mistaken for a loose body. Certain loose bodies such as detached fringes or pieces of articular or semilunar cartilage do not throw a shadow on the screen. In some cases an X ray examination reveals fracture or even detachment of the spine of the tibia. As a rule, this injury is the result of extreme violence. Enlargement of the ligamenta alaria sometimes simulates loose cartilage, and so may pendulous synovial fringes in other parts of the joint. These, unfortunately, do not show with the X rays. Detachment of the *external* semilunar cartilage is far less common, and when it does occur it is liable to be mistaken either for slipping popliteal tendon or internal semilunar. I have found it extraordinarily *movable as a whole*, and especially so in children over ten years who give no very convincing history of a definite injury. One boy could put the cartilage out and in at will during flexion and extension. A very loud click was heard at each movement, and the leg jerked laterally, while a swelling came and went away at the outer side of the patellar ligament.

Slipping of the popliteus tendon usually causes creaking and effusion further back on the outer side of the knee. Many youths, and especially young girls, develop recurrent effusion with insecurity of the knees as a result of prolonged exercise, but there is no history of locking or sudden clicking with agonising pain.

So many things may simulate loose semilumar cartilage that it is not always easy to be quite sure of it; therefore great care must be taken in gathering an accurate history, in making all necessary examinations, and in considering all the possible pitfalls. In many cases accurate diagnosis is impossible, but if the symptoms and disabilities are severe and recurrent, and due care has been taken to exclude the conditions which are not likely to be benefited by an operation, it is wise to advise exploration. As a rule, this soon reveals a removable cause.

Indications for and Against Operation.

1. It is rarely wise to operate after the first detachment, for recovery without operation is possible in these cases, unless the cartilage is actually out of place and cannot be reduced even under an anæsthetic.
2. When an anæsthetic is necessary to replace the cartilage an operation by a skilful surgeon with due care does not add materially to the risk of the patient. But under opposite or doubtful conditions it is clearly better to treat the case conservatively after the replacement. The best evidences of the persistence of the displacement are locking and inability to fully extend the knee, for when the cartilage lies between the prominent part of the condyle of the femur and the articular surface of the tibia, it is practically impossible to extend the knee to the full extent.
3. When the cartilage only causes slight symptoms but no actual disability for work or necessary exercise it is not advisable to operate; but
4. If frequent displacement interferes with the capacity of earning a livelihood or of taking necessary exercise an operation should be recommended.
5. It should be urged for recurrent displacement when the patient is liable to go to risky places where a sudden detachment may land him and perhaps his fellow workers in danger.
6. For soldiers liable to active service and coming under Groups 4 and 5 an operation is necessary. The same treatment seems to me to be advisable in them for severe first displacements calling for an anæsthetic for their replacement. It is clear that under the trying conditions of active service recurrence is very liable to take place, and much time is wasted by treating such cases too conservatively. On the other hand, slight displacements causing only transient symptoms are best treated conservatively and the patient kept on home service or garrison duty.

II. *Operation for Loose Internal Semilunar Cartilage.*

It is probable that most of the imperfect results of operation are due to errors of technique, and particularly to failure to take full advantage of a tourniquet. By using a tourniquet and making the operation bloodless the operation is made very much easier and safer, for the surgeon can see quickly what is wrong and deal with it in a few minutes. There is no need to use any sponges or to introduce anything into the knee except sterile instruments. Manipulations and undue irritation by frequent sponging, long exposure, and, above all, the escape of blood into the knee-joint are avoided. All these tend to cause synovitis and even infection, and therefore delay the after-treatment by massage, movement, and exercises. Many surgeons do not use a tourniquet at all for this operation, being afraid of bleeding into the joint after the operation. Many others remove the tourniquet towards the end of the operation in order to secure the divided blood-vessels. This is entirely unnecessary, and the tourniquet should not be removed until the

wound has been accurately sewn up and the bandages firmly applied over a massive dressing. Under these circumstances there is no reason why a patient should be laid up any longer after an operation for loose cartilarge than after an ordinary slipping of the cartilage—in fact, the removal of the cartilage should hasten the recovery of function.

Most of the disabilities following the operation are due to the effusion of blood or fluid in the knee as a result of (*a*) faulty technique, (*b*) various degrees of infection, and (*c*) unnatural restraint imposed upon the knee after the operation. Whenever possible the patient is made to rest his knee for two or three days before the operation, so as to lessen the effusion and congestion of the synovial membrane. The skin is carefully prepared. It is shaved, if necessary, from the middle third of the thigh to the middle third of the leg, then washed with ether, painted with tincture of iodine, and a sterile pad applied. When the patient is under the anæsthetic the leg is held up for several minutes to empty it of blood as far as possible, and then a flat rubber tourniquet is applied very tightly around the middle of the thigh. The knee is nearly semi-flexed over pillows or over the end of the table, and sterile towels are carefully arranged and secured to the thigh and leg. A vertical incision[1] 2½ inches long is made over the interval between the tibia and femur, one inch internal to the ligamentum patellæ. The wound extends downwards half an inch below the upper border of the tibia. Sterile gauze pads are clipped to the edges of the wound before the knee-joint is opened. These leave no skin exposed. The capsule is opened freely and generally some fluid escapes. By retracting the edges of the capsule a good view is obtained of the anterior part of the internal semilunar cartilage, and any abnormality of this part can be seen at once. In many cases a tongue-shaped piece is semi-detached and turned inwards. In others the whole of the anterior part is loose. In others the two ends are the only parts attached, the middle portion often lying in or towards the intercondyloid notch. In some cases the cartilage looks normal, but proves unnaturally movable backwards and forwards as a whole. In a few cases the front end seems normal, but on drawing the cartilage forwards and flexing the knee a detached piece can be seen turning in from the posterior part of it. While the assistant retracts the edges of the wound the surgeon detaches the front end of the cartilage from the tibia with the knife and draws it forwards and inwards with a Mayo-Ochsner forceps, while he gradually separates the middle and posterior parts from the tibia and capsule of the joint. The separation of the posterior part is made easier by further flexion of the knee, and especially by the use of a strong blunt-ended tenotome. Nearly the whole cartilage is removed, for incomplete removal is a frequent cause of recurrence of symptoms. Unless the cartilage is at fault some other cause of the symptoms must be sought, and, if necessary, the wound prolonged upwards. In many cases the tags of the internal alar ligament are enlarged and œdematous. Sometimes they are very large, white, and hard from frequent injury. These should be removed. In some cases the anterior crucial ligament will be found to be partly detached from the tibia, with its free end frayed, obviously calling for removal. In others a fracture with detachment of part or the whole of the spine of the tibia is seen. In a few one or more loose bodies will be seen in the inter-condyloid notch or perhaps be squeezed from the subcrureal pouch by external manipulation. Exceptionally a fracture of the articular cartilage of the femur will be seen, especially on the front. A tongue-shaped piece of the articular cartilage may flap and display the bony surface of the femur. It can be replaced so that only a linear fracture is seen, but the movements of the patella dislodge it again during active exercise. The whole flap should be removed and the edges of the gap smoothed with a sharp knife. The knee is straightened and the capsule is accurately sewn with continuous fine sterile catgut, and the skin with a continuous suture of linen thread. A sterile pad is placed on the wound and secured by a sterile gauze roll. Then a large pad of Gamgee tissue or cotton-wool is applied all around the lower third of the thigh, the knee, and the upper third of the leg, and this is bandaged firmly but not very tightly. Another thick layer of cotton-wool is applied and very firmly bandaged, taking care to leave the upper edge a little looser than the rest, in order to avoid discomfort and swelling of the knee and leg. For the same reason a cuff of wool extends both above and below the tight bandages. Then the tourniquet is removed. No splint is applied, but the knee is slightly flexed over a soft small pillow and the limb is raised on a wedge pillow.

[1] Curved incisions trespassing on the important internal lateral ligament are to be condemned, and so are low incisions approaching the cartilage from below and giving no adequate view of the interior of the joint.

III. *The After-Treatment.*

As a rule there is very little pain and rarely any that is not controlled by doses of aspirin, gr. x. Every day from the beginning the knee is moved a little more. A hand is placed under the knee and the limb thus very gradually flexed. Then the heel is lifted up and a hand is placed on the front of the knee to straighten the latter. No pain need be elicited if this method is adopted early and gently enough. At the end of three or four days the outer bandage and layer of cotton-wool are removed and, if necessary, the inner bandage is slackened a little, but the sterile dressings are not disturbed until the end of a week when the stitches are removed. Then the patient is allowed up on a wheel chair with the leg slightly flexed. On the tenth day he is allowed to walk about somewhat stiff-kneed, taking care to keep the diseased leg always in front of the healthy one, and to put the weight chiefly on the heel. This prevents the knee giving way. From the beginning the extensors of the knees are gently massaged, and the patient is encouraged to use these muscles and to move the knee a little more every day. The patella is moved sideways and up and down upon the femur every day. All passive movements are gentle and steady, and never sudden or jerky. At the end of a week flexion to a right angle is generally easy and comfortable. Massage of the knee-joint is not commenced before 12 days, when the wound is firmly healed. Exercises against resistance are very valuable in developing the muscles. Radiant heat and cataphoresis are often desirable, and a crêpe bandage around the knee *only* is useful for about a month. While the application of splints with delay in active movements are extremely detrimental, violent passive movements commonly cause effusion, pain, weakness, loss of confidence, and delay in recovery. Similarly, prolonged standing and fatigue from any form of active exercise in the early days delay recovery. All movements should be gentle, all exercise short of fatigue. With due care the patient is generally walking about fairly well at the end of a fortnight. Movements and power are almost perfect within a month or six weeks.

THREE CASES OF SEPTIC INFECTION DUE TO OTITIS MEDIA.

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THE three cases referred to in these notes made their appearance in a military hospital at about the same time. As there is scarcely a problem connected with septic infection following on aural disease which was not involved in their management, and as the results in the second and third cases were most gratifying, we have thought it worth while to place a summary of the facts on record.

CASE 1. *Otitis media: broncho-pneumonia; abscess of neck; cerebellar abscess; death.*—Private, aged 20, admitted to hospital with profuse otorrhœa on right side. The ear had discharged for a long time previously and apparently had not been treated. Small perforation of membrane and some tenderness behind mastoid process. Temperature normal, pulse 64 to 74, and respirations 16 to 18. Two days after admission temperature suddenly rose to 104·4°, pulse to 86, respirations to 20 but no rigor. The mastoid process was immediately opened up; some granulation tissue found in antrum and one small pocket of pus in mastoid process.

Shortly afterwards patient developed broncho-pneumonia, apparently streptococcal in origin, and temperature range rose daily to 102° for about 10 days, when it became practically normal. General condition fairly good, but he did not progress; no definite symptoms referable to head. Examination of eyes, however, on eighteenth day after admission showed optic neuritis with hæmorrhages on opposite (left) side. The following day blood count showed very slight leucocytosis.

Exploratory operation; mastoid wound was enlarged upwards and backwards and a large extradural cerebellar abscess evacuated. Lumbar puncture gave no indication of any abnormality of cerebro-spinal fluid. Condition remained somewhat unsatisfactory, with temperature rising to 102° until forty-third day, when optic neuritis was found to have definitely increased. Focal symptoms completely absent. In view, however, of unsatisfactory general condition the bone above and behind mastoid was removed, the dura exposed, and both cerebellum and middle lobe explored with negative results.

On the fiftieth day a deep-seated abscess in back of neck on both sides was evacuated. It was apparently unconnected with mastoid, at all events no gross connexion was visible. The pus was streptococcal. On fifty-second day internal jugular vein was exposed and tied, but patient died of exhaustion three days later. No vomiting and cerebral symptoms absent from beginning to end.

The post-mortem report was as follows: Lungs congested, less resilient than normal. Heart fatty with a little fluid in pericardial sac. Kidneys congested. Brain: dura slightly adherent over vertex. Cerebral vessels turgid. Cloudy yellow fluid issued from beneath tentorium. On raising tentorium patches of lymph were observable on right half of cerebellum. Whole of under surface of cerebellum and pons was coated with layer of lymph. There was an abscess cavity in right half of cerebellum in antero-inferior portion. It was irregular in shape and approximately 2 × 1½ cm. in size.

This case was noteworthy because there were no symptoms of cerebral complication. The guarded prognosis given throughout was based on the continuance of the left optic neuritis. The existence of optic neuritis was the more remarkable, as from first to last there was no suggestion of raised intracranial pressure.

CASE 2. *Otitis media; mania; infarcts in lungs and intestines; gluteal abscess; recovery.*—Private, aged 28, admitted into hospital with profuse otorrhœa on right side. History of long-standing ear disease; apparently no treatment. Temperature on admission 100·2° F.; pulse 72. Small perforation of membrane and some slight tenderness over mastoid region. Two days after admission temperature suddenly rose to 104·8° and pulse to 96, but no rigor. He became semi-maniacal and had to be put under restraint. A swelling appeared below mastoid process, and operation was performed on sixth day after admission. Whole of mastoid process was riddled with collections of pus, but lateral sinus apparently normal. On fourth day after admission white blood count was 15,300. After operation mental condition improved, but temperature oscillated between 103° and 98·8° until eighth day, when he developed in rapid succession diarrhœa with blood-stained mucous discharge showing *Bacillus coli*, pulmonary infarction with hæmoptysis, and a large gluteal abscess extending down to sacro-sciatic notch. Pulse rose to 150 and temperature remained irregular. A blood culture at this stage showed streptococci. There was no optic neuritis, but there were patches in his eye of old choroido-retinitis. On fifteenth day jugular vein was ligatured in neck and lateral sinus exposed and obliterated; abscess in gluteal region drained. The exposed dura mater was explored with negative results. Fifteen ounces of pus were obtained from gluteal wound. From this point recovery was steady and only interrupted by suppuration along track of jugular vein which gave no serious trouble.

The recovery of the man is remarkable and is really an indication of the possibilities of successfully combating gross septic infection.

CASE 3. *Otitis media; extensive mastoid involvement; septicæmia; recovery.*—Rifleman, aged 25, admitted into hospital with profuse discharge from right ear. History of long-standing otorrhœa; apparently no treatment. On admission tenderness over mastoid region; temperature ranged between normal and 100° F.; pulse 104. Discharge very profuse. Usual mastoid operation at once performed; greater part of mastoid process was removed by reason of extensive infiltration with pus. Lateral sinus appeared normal, but there was a small sinus leading down to cerebellar dura mater which was curetted. The whole of the suppurating bone could not be removed for obvious anatomical reasons. On the fifth day after admission temperature rose to 105·6°, pulse to 140, respirations to 30. He sweated profusely and was seriously ill without definite localising symptoms. Temperature subsided somewhat, but condition not satisfactory. Blood count showed white blood corpuscles 13,100. On tenth day jugular vein was tied and lateral sinus traced backwards and obliterated by pressure in mastoid region; dura not opened. The patient was not relieved and developed stiffness in back of neck with muscular rigidity. Fluid obtained by lumbar puncture appeared normal. His condition remained unsatisfactory, temperature rising to 102°, when an abscess appeared along course of jugular vein, and on its evacuation symptoms came to an end; excellent and uneventful recovery. Cultures made from blood during course of disease showed streptococcal infection.

Reviewing these three cases it is difficult to assign a positive and specific value to ligature of the jugular vein, but the impression left in mind is that the operation was of definite service. The recovery of Case 2 is remarkable and illustrates so well the general rule that whilst septic infections in aural cases within the dura mater are too often fatal, recovery can be expected in many septic aural cases with the grossest lesions so long as the infection is outside the dura mater. It should be stated that antistreptococcal serums were freely employed in all three cases. The operative procedure throughout was effected, so far as the aural work was concerned, by Captain William Wilson, R.A.M.C. (T.C.), and so far as the general surgical procedure was concerned, by Captain S. W. Maslen Jones, R.A.M.C. The post-mortem and pathological examinations were made by Captain E. C. Myott, R.A.M.C.

LIGATURE OF COMMON CAROTID ARTERY.

NOTES ON THREE CASES AT A CASUALTY CLEARING STATION.

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IN those cases of injury to the large vessels of the neck which escape death upon the field from primary hæmorrhage, operative treatment is seldom called for before the patient reaches a base hospital. The conditions usually presented at a casualty clearing station are either a small deep traumatic aneurysm or, more commonly, an arterio-venous aneurysm of variable size, while in a few rare cases of severe reactionary or secondary hæmorrhage ligation may be indicated.

An aneurysm increasing in size or dangerously superficial in neighbourhood of wound may necessitate early operation, but all other cases are best treated by rest and observation. At the end of 14 days, if the tumour be stationary or decreasing in size, they may be transferred to the base, where spontaneous cure will sometimes occur after several weeks or operation can be performed when the limit of diminution is reached.

An aneurysm existing for even a few hours is the best preparation for ligature owing to the fact that the collateral circulation is gradually and not suddenly called upon to supply the area of deprivation, and can adequately cope with the requirements of the tissues when complete cessation of supply through the original channels is effected. This is well exemplified in the case of the popliteal artery where severance of the vessel by a bullet, even without much loss of blood, almost invariably leads to gangrene of the leg, while ligature for traumatic aneurysm very seldom does so; the Letouffier tube aims at the performance of this function of an aneurysm in the provision of a modified supply of blood while the critical period of collateral expansion is tided over.

During 30 months in a casualty clearing station, amongst a total of 44,000 wounded, I have seen only three cases in which ligature of the common carotid appeared to be indicated, each for one of the three conditions enumerated above—severe secondary hæmorrhage, dangerously superficial aneurysm, and a tumour which increased in size despite rest in bed.

CASE 1.—Private, wounded on Dec. 28th, 1914. Rifle bullet entered neck posteriorly at level of fourth cervical vertebra and one inch from middle line on left side. Ascending ramus of lower jaw and alveolus of upper on left side were shattered. Malar bone fractured but not comminuted, and whole cheek from mouth to ear torn in shreds. He was in a state of collapse and much exsanguinated when admitted to No. 2 Casualty Clearing Station eight hours after being wounded. An intravenous saline, containing two drachms of brandy, was administered, and this, combined with warmth, gave rise to severe reactionary hæmorrhage. The large gauze plugs in the wound were quickly withdrawn and, aided by the patient fainting, several large fragments of bone and loose groups of teeth were removed. No bleeding points were secure, but a ligature was applied to twisted end of facial artery which lay free in wound. Packing sufficed to arrest welling up of blood from deeper parts at the time, but on following morning another severe hæmorrhage occurred and under an anæsthetic I tied the external carotid through an incision extending from the wound.

For four days there was no further hæmorrhage, but the wound became extremely septic and the fœtor, associated with large wounds of the mouth, was unpleasantly pronounced. On fifth day violent hæmorrhage took place while patient was drinking some lemonade. The blood appeared to flow from the internal carotid where ulceration of vessel had probably occurred. He rapidly became semi-conscious and, under a light anæsthetic, I tied the common carotid through transverse incision. This wound was covered with gauze and collodium and remained aseptic throughout. This operation rendered him completely aphasic and hemiplegic for three days and very dangerously ill for a week. On fourth day he suddenly called out "Here," and this word was used to express all his wants until the seventh day when his vocabulary commenced to increase and, in certain moods, to intensify considerably. First voluntary movement of right arm and leg occurred also on fourth day after operation. He was very irrational for about 10 days and required nasal feeding on several occasions. When transferred to base, three weeks after last operation, the movements of limbs of right side equalled those of left in vigour and he was cheerful and sensible although still very weak. Five months later he wrote from Ireland to say that he was quite well except for "the extra little hole in his face."

CASE 2.—Private, wounded on July 26th, 1916. Shell splinter entered left side of neck at anterior border of sterno-mastoid immediately above level of cricoid. Prior to admission to No. 44 Casualty Clearing Station fine gauze plugging had been packed into wound and hæmorrhage successfully arrested. A large superficial arterio-venous aneurysm was present with loud "machinery" bruit and distinct "prickly" thrill. He complained of continuous roaring noises in the head, like breakers on a shore, which forbade sleep; considerable discomfort on swallowing or movement of head, but no actual pain.

As the aneurysm was large and dangerously near the surface, exposing him to risk of copious hæmorrhage on extrusion of plug, I ligatured common carotid on following day. No change visible in face on tightening of ligature. On removal of gauze plug from wound considerable venous hæmorrhage took place. The sac was freely exposed and the veins leading thereto, including internal jugular, were grouped together above and below and ligatured. As the hæmorrhage was thereby completely arrested, the artery which had been undisturbed at seat of injury was not ligatured distally. Missile not searched for. No post-operative symptoms. Noises in head had disappeared completely; no trace of paralysis or aphasia. He was transferred to base on tenth day after operation, and three months later wrote that missile had been extruded on Oct. 1st through small sinus at seat of original wound without operation, and he was about to have a board with view to return to active service.

The third case was undertaken for an enlarging tumour which proved to be an abscess in the laminæ of the original aneurysmal sac, and unfortunately ended fatally.

CASE 3.—Private, wounded on right side of neck by shell fragment on Oct. 24th, 1916. He was admitted as a walking case to No. 44 Casualty Clearing Station eight hours after being hit, with temperature 102° F. and pulse 120. Wound small and in mid-line of sterno-mastoid immediately below level of cricoid. No external hæmorrhage after admission, but patient said it had bled freely at first and then stopped of its own accord. A small deep pulsating tumour felt; distinct aneurysmal thrill and also a bruit, which was, however, more easily audible over temporal artery than through fascial and muscular layers.

The tumour increased in size for two days but caused very little discomfort, temperature and pulse falling steadily. On third day it was visibly smaller and continued to decrease in size until seventh day, when he felt "champion" and talked and ate with great gusto. On evening of eighth day pulse rose from 68 to 84 and temperature from 98·6° to 99·8°, the swelling being slightly larger. He slept well, however, and felt better the following morning. He complained of tiredness; towards evening respiration appeared slightly interfered with. The slight irritative cough which had affected him throughout sounded harsher. On following morning pulse had dropped from 96 to 82, temperature 99°, and he felt again a little better, but swelling had increased considerably towards root of neck, and lips and ears showed a slight degree of cyanosis. I decided to operate, and through long oblique incision first disarticulated and removed portion of inner end of right clavicle to have ready access to artery in event of rupture of sac. The common carotid was ligatured about 1½ inches above innominate bifurcation The tumour caused vessels of neck to curve outwards, while trachea and œsophagus were pressed over to left of middle line. The large tumour was then incised, and out flowed several ounces of creamy pus. When this had been mopped away an inner tumour about size of large hen's egg became visible—the actual aneurysm. The pus cavity, developed in intermediate laminæ of original aneurysmal sac, surrounded the aneurysm on all sides except posteriorly, and stretched up behind sterno-mastoid muscle to mastoid bone. Two fingers could be easily passed between œsophagus and prevertebral fascia. The aneurysmal sac was then incised and a finger placed upon bifurcation of carotid immediately below which lay an oval slit about 15 mm. in length on anterior aspect. Jugular vein appeared unwounded. A distal ligature was applied and the wound left open. The patient never rallied and died four hours later. Post mortem: Jugular vein found intact, but bound down with the vagus nerve in dense inflammatory tissue. Nothing beyond slight comparative congestion of left cortex observable in brain. Smear of pus showed numerous micrococci and several organisms closely resembling *B. perfringens*. Pericardium contained 152 c.c. of clear fluid. The small fragment of metal lay embedded in some enlarged deep cervical glands on left side.

The heart tires with great rapidity under even a small degree of respiratory embarrassment due to obstruction of the air-passages in the neck, whether the cause be aneurysmal or a wound of larynx or trachea. The facts of the external wound having practically healed over the sterno-mastoid, the masking of the presence of the pus stratum by the deep fascia, and the patient's appearance and sense of well-being until the morning of operation, appeared to justify the hope that a second diminution might occur. Delay in operation was disastrous, and the experience of this case would lead me in future to operate at once upon an aneurysm which, having become quiescent, again commences to enlarge.

THE MEDICAL REGISTER.—The official Register just issued contains the names of 43,481 persons, of whom 54·2 per cent. are on the local Register for England, 31·8 per cent. for Scotland, and 14 per cent. for Ireland. 1202 names (including 123 colonial and 7 foreign registrations) were added during the year, and 59 names were restored. 1005 names have been removed from the Register during the year: 983 on evidence of death, 14 under Sec. XIV. and 8 under Sec. XXVIII.-IX. of the Medical Act, 1858. This accounts for all the removals, it being significant that no registered medical man has formally removed his name as having ceased to practise.

DOWN DISTRICT ASYLUM, DOWNPATRICK.—During 1916 the total daily average number of residents in the lunatic asylum at Downpatrick was 778, 412 men and 366 women. The patients admitted were seven less than in the previous year and the net average cost per head showed an increase of only £2 16*s.* 9*d.* as compared with 1915, the amount received for the maintenance of paying patients being exceptionally large. From the farm there was a net profit for the year which ended March 31st, 1917, of £2142 4*s.* 9*d.*

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

DOUBLE DISLOCATION OF JAW SIMULATING FRACTURE OF THE SKULL.

BY E. C. HARE, M.R.C.S. ENG., L.R.C.P. LOND.,
LIEUTENANT-COLONEL, I.M.S.;
AND
SYDNEY J. COLE, M.D. OXON.,
MEDICAL SUPERINTENDENT, WILTS COUNTY ASYLUM, DEVIZES.

THE following case, in which double dislocation of the jaw backwards into the external auditory meatus induced symptoms simulating fracture of the base of the skull, gave rise to interesting diagnostic questions.

The case was that of a tall, well-built, well-nourished man, aged 23, who had been an inmate of the Wilts County Asylum since April, 1916, on account of epilepsy. The fits occurred frequently, were of a severe type, and attacked him without warning. He had a broken nose and several old scars on his face, the result of injuries sustained in falls that had occurred in previous fits. On March 15th last he was walking in one of the airing courts, when suddenly in a fit he fell forwards "like a log," and struck the point of his chin on the asphalt pavement. He was at once found to be bleeding not only from a deep lacerated wound on the chin, about an inch long, but also from both ears. Within a few minutes he was rolling about on the ground and moaning. He was carried into the hospital ward, and it was then found that his jaw had been driven backwards and was fixed almost immovably in the closed position. On attempting to move it, crepitus was felt, though no fracture of the jaw could be located. By the following morning he was able to talk and to drink milk; but he continued very stupid and apathetic, so that it cannot be stated whether his hearing was affected to any extent. There was some swelling and pain in the neighbourhood of each temporo-maxillary joint. Mobility of the jaw was not recovered, and the patient remained unable to take any but liquid food. The discharge from the ears was practically continuous, being bloody till the eighth day from the injury and then serous. On the eleventh day about a teaspoonful of pus came away from the left ear, and on and after the seventeenth day pus was exuding from both ears. On the seventh day the temperature rose rapidly and reached 102·8° F. Irregular pyrexia continued until the nineteenth day, after which, in spite of the purulent discharge from the ears, the temperature remained subnormal for several days, until after the onset of a status epilepticus. He had had occasional epileptic fits since the accident. On the twenty-sixth day the fits became frequent, 20 being recorded for that day, 10 for the twenty-seventh day, 27 for the twenty-eighth, and 15 for the twenty-ninth day up to the time of his death at 1.20 P.M. (April 12th). The fits appeared comparable to a typical status epilepticus and classical symptoms of meningitis were absent.

It was expected that a fracture would be found extending across the base of the skull, but post-mortem examination showed that there was no fracture of the base in the ordinary sense of the term. The base as viewed from within the cranium was intact, and there was no injury or recent disease of any of the cranial contents. There was a fracture of the tympanic plate of each temporal bone and septic arthritis of both temporo-maxillary joints. What had happened in the fall was that the condyles of the jaw had been driven backwards, smashing the tympanic plate, encroaching upon the external auditory meatus, and opening a way from the meatus into the joint, with the result that septic arthritis had been set up. There was no fracture of the jaw.

CASE OF ULNAR PARALYSIS; ULNAR-MEDIAN ANASTOMOSIS; RECOVERY.

BY J. K. HAWORTH, M.D., B.S. DURH.,
CAPTAIN, R.A.M.C. (S.R.); SURGICAL SPECIALIST, 8TH LUCKNOW DIVISION.

ON April 9th, 1916, in Mesopotamia, Private H—— was shot in the left forearm just below the elbow on the inner side by an explosive bullet. In December, 1916, he was admitted to Lucknow Station Hospital suffering from typical

ulnar paralysis of left hand. He complained that his hand was useless and he wanted something done. On examination the ring and little fingers of his left hand were flexed markedly and quite useless, and blue in colour. He could not move them and could feel nothing. There was marked wasting of the interosseus muscles. He could not move the fingers apart.

Operation, Feb. 10th, 1917.—A curved incision was made over the front of the left arm. The lower part of the ulnar nerve was found and seemed of fair size. The nerve was dissected out and taken under the flexor muscles and let into the median nerve by a valve-like slit, being held by a very fine catgut suture. The nerves were held in apposition by a skein of catgut passed round the nerves outside of a layer of membrane from the inside of a boiled egg. The wound was closed and healed perfectly. Sixteen days afterwards he noticed the two fingers were no longer blue, but pink and healthy-looking. He could just feel a little in them. Some days later he could move them a little. On examination, six weeks after the operation, the fingers looked normal. He could move them fairly well, even to extending them and flexing them to almost their full limit. He could feel quite well in them and could slightly separate them. He stated himself that the use of his hand was rapidly improving. He has been transferred to the Electrical Institute, Dehra Dun, for treatment.

Remarks.—The nerve may never have been divided by the wound yet held by very dense scar-tissue. Whether an attempt should have been made to free the nerve or not is doubtful. The scar-tissue would doubtless have bound it down again so it might appear that the cross anastomosis of nerves might be useful in similar cases.

Reviews and Notices of Books.

Surgical Therapeutics and Operative Technique. By E. DOYEN. English edition prepared by the author in collaboration with H. SPENCER-BROWNE, M.B. Cantab., Élève de l'Institut Pasteur; et Chef de Clinique de l'Institut Doyen. Vol. I. London: Baillière, Tindall, and Cox. 1917. Pp. 746. Price 25*s.* net.

THIS book is not a mere literal rendering of the French edition of Doyen's great five-volume work, but at Dr. Spencer-Browne's request the author rewrote several portions of the original before the translation was undertaken so as to make it exactly representative of the present practice of the clinic with which the two were associated as chief and first assistant. The English edition therefore represents the methods employed by a brilliant surgeon as improved by him nearly up to the time of his death. The volume now issued is a first instalment of three which are to contain the substance of the French five. Not the least interesting portion of this volume is the historical introduction, in which there are reviewed the methods which have from time to time been employed for the arrest of hæmorrhage. Chapters follow in which the instruments preferred are described, some of them at great length; for instance, nearly 10 pages and 17 illustrations are devoted to the account of the operating-table devised by Doyen. Many of the instruments were invented by him, a department of surgery in which he showed great ingenuity. While much of the advice given on surgical technique is sound, statements occur here and there which would not be endorsed by many surgeons. On two main principles the author specially insists. The first of these is that time should not be wasted in the course of an operation by ligaturing bleeding vessels. Doyen holds that many vessels are tied quite needlessly, for if the occlusion of these vessels had been left to the end of the operation many of them would not have required ligature at all. The second principle is bound up with the first; it is that operations should be completed as quickly as possible. When a tumour has to be removed it should be got away as rapidly as possible, for if this is done the shock to the patient is diminished and less blood is lost.

So far as the book may be judged by this first volume it will serve a useful purpose in laying novel ideas before the surgical reader, acquainting him with methods found useful by an adroit operator and furnishing valuable suggestions on the use of instruments. The translation is good on the whole, but phrases and expressions occur which are hardly current in medical English. We may quote a few examples. "A wen of the hairy scalp" is not an improved rendering for "a sebaceous cyst of the scalp." Readers may reasonably ask: Where is the "genal region"? What is a "recoil screw"? The sentence: "The phenol vapours chased the flies" has the virtue of being graphic if unusual, but "The pavilion of the ear" may merely mystify. Consultation of a good medical dictionary would clear up the difficulties, let it be admitted, but authors should not put this trouble on their readers unnecessarily. These are small matters, and only the translator knows the difficulties of his task, but at the present time when a large proportion of the medical profession can enjoy the Gallicisms in their original form, it should be the translator's task to render into current English.

The Involuntary Nervous System. By WALTER HOLBROOK GASKELL, M.A., M.D., F.R.S. With coloured figures. London: Longmans, Green, and Co. 1916. Pp. 178. Price 6*s.* net.

THIS first volume of the proposed series of monographs on Physiology, edited by Professor Ernest H. Starling, leaves physiological science painfully aware of the serious loss it has sustained by the regretted death of Professor Gaskell. It is to him above all others, as Professor Starling declares, that we owe our present knowledge of the involuntary nervous system. The monograph under review represents the finished product of the activities of one who for no less than 40 years devoted himself to the meaning of the nervous system and the problems that have arisen from its study. At a time when recent researches on the sympathetic nervous system have served to indicate its great importance physiologically and clinically it is gratifying to have from the hands of a master a consistent and harmonious account of the significance of the involuntary muscular systems in the higher vertebrates both from a morphological and from a physiological point of view.

It is difficult, in a brief review, to indicate even the general conclusions of a book which will repay perusal from cover to cover. Professor Gaskell divides the involuntary muscular systems of the body into various groups, vascular, ectodermal, endodermal, sphincter, and so on. The muscles of some of these contract under the influence of adrenalin, the endodermal only in the presence of acetyl-cholin. We have thus an adrenalin group and an acetyl-cholin group. These two groups are supplied by fibres from two distinct nervous systems—viz., the sympathetic nervous system (in the old sense) and the enteral nervous system. Further, the motor nerve cells of these two nervous systems are in turn connected with the central nervous system, again by two separate arrangements, the former by the thoracico-lumbar outflow from the spinal cord, and the latter by the bulbo-sacral outflow. The nerve cells of both these systems were, it is known, originally in the central nervous system and have travelled out from it. The cells of the sympathetic nervous system are linked to cells containing adrenalin (the chromaffin system), which presumably existed originally in the central nervous system as adrenalin-nerve cells, and became separated, though still associated, as they passed out. On the other hand, the cells of the endodermal system (enteral) have travelled out as far as the muscles themselves, and have been accompanied by inhibitory cells from the sympathetic system; in both cases there is abundant evidence of reciprocal innervation between the two groups, enteral and sympathetic. Of still greater speculative interest is Professor Gaskell's theory of the conversion of the nervous system of the invertebrates into that of the vertebrates. He believes that the central nervous system of the invertebrates has formed the central nervous system of the vertebrates by growing round and enclosing the alimentary canal of the former, so that the alimentary canal as found in the vertebrate is a new formation derived from structures already existing in the invertebrate ancestor. For the details of the process the reader must turn to the book itself.

As may be imagined, a monograph of this description, representing the considered conclusions of a lifetime of research, cannot be gauged by any easy standard of superficial criticism. Its appeal, however, is not to the physiologist alone. The scientific clinician will not fail to grasp

its bearing at many points on the phenomena of clinical medicine. It is a book of comparatively few pages, but it is deserving of serious study, and with its broad lines of investigation and wide outlook is eminently calculated to arouse interest and stimulate discussion.

Finch and Baines: A Seventeenth Century Friendship. By ARCHIBALD MALLOCH, M.D. McGill, Captain, C.A.M.C. Cambridge University Press. 1917. 4to. Pp. 89. 10*s.* 6*d.* net.

THE story of the friendship of the two seventeenth century doctors, Sir John Finch and Sir Thomas Baines, is one of considerable psychological interest, and Captain Malloch has told it exhaustively in this beautifully illustrated quarto volume. Every line of the text and the large number of references to authorities, living and dead, as well as quotations from written and printed manuscripts, prove that he has spared no pains to put the two seventeenth century worthies before us exactly as they lived. Almost always in the perpetual coupling of the names Finch comes before Baines, and in public life he occupied the more prominent position. Son of the Recorder of London, brother of the Lord Chancellor, professor of anatomy at Pisa, and English Ambassador at Constantinople, he led a full and distinguished life, but during nearly forty busy years in various European capitals he always remained in the closest touch with his college friend Baines. Together they left Christ's College, Cambridge, after graduation, together they toured Europe, and together they received medical degrees at Padua; Baines lived at Pisa during Finch's professoriate, and at Constantinople with his Embassy; both were knighted, though not simultaneously, and together they were made Fellows of the Royal College of Physicians of London; after 36 years of the closest business and intellectual intimacy they died within a year of each other; in their wills they both endowed their old College at Cambridge, and they were buried together in the College chapel. The probability is that each without the other was incomplete, and that Baines supplied for his more brilliant friend a certain weight and solidity of character wanting in the affectionate and credulous Finch, but such complete fusion of two identities, even though it be thus superficially explained, is none the less extraordinary. Captain Malloch has supplied us in this beautifully printed and illustrated book with an interesting historical and medical note.

JOURNALS.

Military Surgeon.—The April number of this journal opens with an article by Dr. Fielding H. Garrison on the foresightedness of Lauder Brunton in respect of the position of Great Britain on the occurrence of war. We comment on this article elsewhere. Surgeon R. G. Heiner, United States Navy, Instructor in Hygiene at the Naval Academy, writes an interesting paper insisting that it is quite easy to work for five or six days at high pressure with no food, or only carbohydrate food; that for the first 10 or 20 hours there is discomfort, but that afterwards there is loss of appetite and ability to work for 16 hours a day for the next five days, with marked increase in nervous and muscular energy. There should then be given a glass of milk, after which the man will sleep soundly for several hours, and waking will have a good meal and again go to sleep; on re-waking he will have a ravenous appetite and will eat heartily and sleep soundly for the necessary three days' rest period. His weight will return to the normal or a little above, and there will be little inconvenience when he again commences to fast and work. This system, Surgeon Heiner urges, will make the food-supply of armies much easier for generals, and will give artisans much better housing, saving, too, their daily train journeys, for they will sleep in airy dormitories at the works during their fasting spells and go home to their houses, far out in the country, for their week of rest twice only in a month. Exercise should be taken after eating, light exercise after breakfast, and the most heavy exercise after the evening meal. Stimulant, which seems to mean coffee, should be given after meals. This system would, he thinks, be of special advantage in the treatment of tuberculosis. The paper will well repay perusal, and everyone will remember how our soldiers, after a "big push," when they had done great work on small rations, did little when they returned but eat and sleep. The wounded, for three days after they returned to England, slept all the time, dropping off to sleep again at once after they had been wakened to take food. Captain E. C. Jones, Medical Corps, U.S. Army, has an article on military dogs, and mentions that three ambulance dogs after a battle in Manchuria found 23 wounded men when the Russian stretcher-bearers thought they had brought all in. He also tells how police dogs are used in New York City to assist policemen on patrol and notes that they prevent burglaries, finding concealed thieves so certainly that burglaries are not now attempted. Lutz, the French scout dog of Verdun, is mentioned, whose growling on Feb. 21st, 1916, gave the first warning of the German advance.

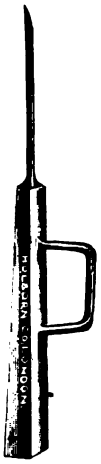
Maternity and Child Welfare. Vol. I., No. 5, May, 1917. 6*d.* net.—The plan adopted in this periodical of publishing several short articles on the same subject written from different points of view is a good one. This month the crêche is discussed in this way. The Atlas and Gazetteer of Child Welfare work is interesting; the Newcastle-on-Tyne district is dealt with. An article on the Federation of Hospital Treatment for Children, by Dr. C. J. Macalister, outlines a scheme for providing adequate treatment for sick children by the coöperation of the various hospitals and convalescent homes in any given district, with the Invalid Children's Association as a clearing-house. Such a scheme is already in force at the Royal Southern Hospital, Liverpool, and as the writer remarks, "If this can be done in connexion with one hospital, why should it not be carried out in connexion with them all?"

Correspondenz-Blatt für Schweizer Aerzte. 49. Jahrg. 1917, May 12. Basle: Benno, Schwabe, and Co.—Professor A. Jaquet recently retired from the controlling editorship, after being associated with the journal since its commencement 24 years ago, being succeeded by Dr. E. Hedinger, professor of pathology in Basle University, whose influence is seen in the present number, which contains nine closely printed pages of excellent abstracts from German, French, and English medical literature. Dr. Huber-Pestalozzi, of Zürich, writes on the treatment of gonorrhœa in Swiss troops at Solothurn, where he has carefully observed Ziegler's postulate not to interfere with the natural and beneficial hyperæmia and inflammatory reaction of the urethral mucous membrane so long as gonococci still remain.

New Inventions.

A NEW NEEDLE FOR THE INJECTION OF ARSENO-BENZOL PREPARATIONS.

A NEEDLE which I have devised for intravenous medication differs from previous needles used for a similar purpose in that it has a handle placed on the upper surface of its mount and over the centre of gravity of the instrument (see Figure), this giving a perfect sense of balance. The mount is of a special shape and is considerably longer than usual. In practice the needle is held by its handle (not by the mount as is the usual method), when it will be found that the "grip" so obtained imparts to the instrument a greater delicacy of touch than has hitherto been possible, and the surgeon can with the utmost ease give to the point of the needle every gradation of movement which may become necessary in order to ensure its entry into a vein; in this way the perception of control is absolute. The mount is 1½ inches long and takes the form of a square pyramid of such dimensions that when the instrument is lying on a horizontal surface the shank of the needle is directed downwards, thus ensuring that the point remains within the lumen of the vein after it has once been introduced. Further, by virtue of the length of the mount and from the fact that each of its four surfaces is flat the mount lies fairly and squarely on the skin while the injection is being made. In actual use the needle has been found to give extremely good results.



The needle has been made for me by the Holborn Surgical Instrument Co., of Thavies Inn, Holborn-circus.

H. W. ABBOTT, M.R.C.S. Eng., L.R.C.P. Lond.

THE LANCET.

LONDON: SATURDAY, JUNE 9, 1917.

Labour Conditions in Factories and Workshops.

THE annual Report of the Chief Inspector of Factories and Workshops for the year 1916 does more than chronicle the sanitary and industrial improvements which a third year of work under war conditions has produced. Perusal of it causes us to realise that out of the horror of war some good, at any rate, may result, and that our industrial workers in the future will profit by the revolutionary changes in their position brought about by the pressure of evil circumstances. The vast scale of the munition works has led to consequences in connexion with the pay and supervision of the workers which have necessarily affected other industries, and when the demand for munitions has ceased, and when those engaged upon producing them are released for other employment, the changed conditions will remain. The institution of "welfare supervision" has mainly followed upon the requisition of women as workers, and the change which their employment has produced may rank among the most important of the social results of the war. The Deputy Chief Inspector of Factories, Mr. H. M. ROBINSON (who signs the report in the absence of Sir ARTHUR WHITELEGGE through illness) shows how necessary the provision of suitable sanitary accommodation for women was found to be in the varied industries where they were able to replace men of fighting age and condition.

Miss A. M. ANDERSON, the Principal Lady Inspector of Factories, adds to the report a series of observations upon the Effect of the Third Year of War on Industrial Employment of Women and Girls, and those are of great interest and importance. In dealing with the general question of the substitution of women for men in industry Miss ANDERSON has definite information to give upon the performance by women of work which was generally believed to be outside the scope of their physical powers. There will always be some work which for physical reasons must be done by men—the fact that some strong women are the physical superiors of some weak men does not alter the case—and Miss ANDERSON finds the limit to the replacement of men by women to lie in certain heavy occupations where adaptation of plant and appliances cannot be effected so as to bring the processes to be carried out within the compass even of selected women. But excluding these occupations, Miss ANDERSON describes the result of judicious selection even in fairly heavy work to have been striking, adding that "it is permissible to wonder whether some of the surprise and admiration freely expressed in many quarters over new proofs of women's physical capacity and endurance is not in part attributable to lack of knowledge or appreciation of the very heavy and strenuous nature of much of normal pre-war work for women, domestic and industrial." That comparatively heavy work is unsuitable for women in itself, and is likely to injure them physically, is apparently not in any way demonstrated by the facts observed by factory inspectors. There appears to be no record of women giving up work on account of it being too heavy or having caused them physical injury, so that to estimate the extent to which such results have occurred or may occur is not possible; but we are told that it is rare to receive a complaint as to the heaviness of her job from a worker, and "the keenness, especially of very young girls, for work at present is pathetic," according to an inspector's report quoted by Miss ANDERSON. For this keenness, and for a zeal to undertake the class of work which has before been reserved for men, one main cause may be assigned. The allotting of rates of pay to women which have hitherto been for men only has had a peculiarly enheartening and stimulating effect, the difficulty being not to find women to undertake men's work at men's rates, but rather, when women have left what have been regarded as women's industries, to replace them in civil employ at the rates of pay prevailing hitherto for women. The result has been what might have been expected. In industries not connected with the manufacture of munitions employers are finding themselves compelled to offer higher wages, as well as to adopt measures for securing the comfort and health of those employed which go beyond the bare demands of the Factory Acts. That the results obtained will be permanent appears to us to be almost beyond question. The importation of women endowed with strength and intelligence in large numbers into the industrial market might have tended to reduce wages and render employers indifferent to the importance of hygienic conditions and all that welfare supervision implies, and may still do so if and when a glut of labour occurs after the war; but in the meantime good wages and, more recently, welfare supervision have contributed with patriotic zeal to bring women into the various industries in which they have now acquired training, and these conditions, once established, will be maintained.

From the whole document one thing emerges with particular clearness, and that is the importance of welfare work among the industrial population, and there seems to us no reason whatever why this work should not be found valuable among male workers as well as among female and juvenile. The case of the latter is more obvious, but it has long been recognised by good employers that much in this direction can be done for male operatives. The influence of overtime work, for example, is probably the same in both sexes, and it is a subject the scientific study of which has been much neglected in this country. But the war has brought it to the front, and it finds prominent notice in Mr. ROBINSON'S report. It is well recognised that continuous and excessive overtime produces a weariness and want of concentration among the

workers which detract from their efficiency—both the quality and the quantity of the output suffer. This point is established over and over again by examples supplied by the inspectors of factories and workshops, and these records, made at a time when the maintaining of the amount and quality of the work has been of vital importance, should do much towards providing for the workers of the future proper conditions of relaxation. It is not necessary to conjecture in what exact directions the currents of industry will flow when war is over to be perfectly certain that workers in the future will not submit to spend their lives in circumstances which they know can be brightened, or in an environment which they know can be rendered less harmful; and all medical opinion will welcome the establishment of this spirit. In the future there will be a demand, and one that cannot be refused, for healthy conditions of life on the part of the operative, and the creation of those conditions in our industrial centres will be insisted upon by an educated and enlightened public opinion. Thus, at any rate, the war will not have produced only misery and sorrow—the fruitless expenditure of wealth and of human life.

Mental Defect and Criminality.

THESE are days of strenuous medical effort and of natural pre-occupation with things military, but it would be matter for regret were the medical profession to overlook two papers, under the modest title of "Notes," contributed by Sir BRYAN DONKIN to recent issues of the *Journal of Mental Science*. Their purpose, briefly, is to comment on a few of the many questions that have arisen of late years out of the problem of the feeble-minded, and in particular on that aspect of the subject which is concerned with the connexion between mental defect and criminality. There are certain topics which have peculiar attraction for the clever, if non-expert, layman, who believes himself competent to deal with such on the basis of what he, a little complacently, calls the scientific method. It is remarkable how frequently the written productions of these men are dubbed "authoritative" by lay press reviewers, and hence become active in misleading serious inquirers. The authors often reveal a high order of cleverness, but it is usually coupled with a less high order of intelligence, and this is particularly true of the increasing literature on criminality, especially in its supposed relationship to mental defect. With no clear perception, or consistent use, of such terms as "crime," "criminality," "heredity," "degeneracy," which denote the very topic of discussion, the pseudo-scientist rushes in where the expert treads with hesitation, and effectually obscures the subject with a cloud of generalisations which will not stand critical analysis. Sir BRYAN DONKIN, than whom few, if any, can speak with more deserved authority, mercilessly pillories these "crude, ill-worded, and ill-considered statements, vitiated by undefined and nebulous terms, and further confused by 'cross divisions.'"

By dint of uncritical repetition of self-styled "scientific" investigations, absorbed in equally uncritical fashion by the reading public, who are unable to distinguish the rôle of the genuine research-worker from that of *vulgarisateur*, the Lombrosian theory that criminals are racial degenerates, and that criminality is hereditary, innate, or constitutional, has found wide acceptance, even in the ranks of the criminal. Sir BRYAN DONKIN, in an interview with a fairly intelligent convict, was informed by him with the assurance of a Hyde Park lecturer that a long course of misconduct was due to the "inheritance of his constitution from a drunken father," while another habitual offender said that as society manufactured criminals it ought not to blame him but to answer for him. If the criminal is born to crime, so must the law-abiding individual be born to abide by the law—an equally natural and equally effortless part to play; but the upholders of the doctrine of the born criminal do not appear to grasp this corollary. Another aspect of this particular doctrine of the born criminal may be alluded to. When it is carried to its logical conclusion we are landed in the metaphysical depths of determinism and irresponsibility; the human organism becomes a complex of reflex automatisms. But in practical life a general ability to choose one's lines of action is assumed; we *act* as though this is so, whatever be our attitude towards theoretical doctrines. In Sir BRYAN DONKIN'S words, the dispute about free will concerns the matter in hand no more than the actual conduct of some men depends on the opinions they hold on the nature and relation of mind and matter.

From long and patient scrutiny of the facts of criminality Sir BRYAN DONKIN states authoritatively that there are no special qualities, physical or mental, common to all criminals, and that criminality is no "unity"; he maintains, further, that the sole link between criminality and heredity is the occurrence of a larger proportion of congenital mental defectives among convicted criminals than in the population at large. All men are potential law-breakers; it is the traditional, not biological, heritage of moral or social experience that saves them. Perhaps the most interesting section of these illuminating contributions to a vexed subject is that in which the author draws clear distinction between inheritance and reproduction in its strict sense. We would urge social workers and other lay authorities to familiarise themselves with the significance of the following teaching, which is based on the work of ARCHDALL REID. So far from a man's "make-up" being referable *either* to natural—i.e., inborn—agencies *or* to acquired factors—i.e., use, experience, education, and so on—human characters are derived *both* from an inborn capacity for developing them *and* from some external stimulus appropriate for their development. There is inheritance without reproduction, but no reproduction without inheritance. It is, of course, a truism that the existence of any quality or character in an individual implies the inheritance of the capacity of development of these qualities or characters; this is true of everything that can be called a

"character" at all, and true of all human beings, social or antisocial. The problem, then, is to account for the actual outward expression of these innate capacities in the individual concerned. What of the innumerable influences that act on men from the cradle onwards? How often is it not said by one or other that he "owes" everything to the influence of some parent, friend, guardian? Men's characters are moulded by their environment in a fashion that no amount of statistical juggling can eliminate; the waifs and strays that enter some of our well-known charitable homes in abundance are weighted, to a high degree in many instances, by the inheritance of criminal capacities, but are these capacities reproduced? The whole fabric of training-ships, schools, homes, and reformatories would vanish at once were potentialities uninfluenced by external actualities. In short, human beings, from criminals to saints, as Sir BRYAN DONKIN says, are the products of their environment as well as of their heredity, but not of the one without the other. This is the view which should be kept steadily in the front in all our attempts to deal with the problem of the mentally defective.

Annotations.

"Ne quid nimis."

THE BIRTHDAY HONOURS.

THE Birthday Honours list issued on Monday last by the Prime Minister appeared contemporaneously with an extended list of honours and promotions directly connected with the conduct of the war. These latter honours, as far as they affect the medical profession, will be found on page 893. We give here a list of the members of the medical profession included among what may be termed the strictly birthday honours, though it is obvious that the recipients have in some cases rendered distinct military service. Dr. Frederick Taylor, President of the Royal College of Physicians and of the Royal Society of Medicine, receives a baronetcy, and knighthoods have been conferred on Professor T. K. Dalziel, Lieutenant-Colonel, R.A.M.C. (T.), lecturer on clinical surgery at Glasgow University; Mr. H. F. Waterhouse, Dean of the Medical School and lecturer on surgery at Charing Cross Hospital, lately surgeon-in-chief to the Anglo-Russian Hospital at Petrograd; and Colonel Robert Jones, C.B., A.M.S., Inspector of Military Orthopædic Hospitals, to whose labours are largely due the existence and efficiency of these institutions up and down the country. Lieutenant-Colonel C. A. Johnstone, D.S.O., I.M.S., has been appointed a C.B. in the Military Division. In the Colonial Office list, Mr. T. Hood, Director of Medical and Sanitary Service, Nigeria, and Dr. F. T. King, medical superintendent of the Seacliff Mental Hospital, New Zealand, have been appointed C.M.G.'s; and knighthoods have been conferred upon Surgeon-General E. Fiset, C.M.G., D.S.O., Deputy Minister of Militia and Defence, Canada, and on Mr. E. C. Stirling, C.M.G., professor of physiology in the University of Adelaide. In the Royal Victorian Order the C.V.O. has been conferred upon Captain R. R. Cruise, R.A.M.C. (T.), ophthalmic surgeon to King Edward VII. Hospital for Officers, and attached to the 3rd London General Hospital. The list includes the following Indian honours: Colonel Hormasjee Eduljee Banatvala, I.M.S., Inspector-General of Civil Hospitals, Assam, receives a C.S.I.; Lieutenant-Colonel D. W. Sutherland, I.M.S., Principal of the Medical College and School, Lahore, and Lieutenant-Colonel J. Anderson, I.M.S., retired, member of the Medical Board of the India Office, each receive the C.I.E.; while Captain R. H. Bott, I.M.S., professor of surgery at the Medical College, Lahore, and Dr. Behari Lal Dhingra, chief medical officer, Jind State, have been awarded the Kaisar-i-Hind Medal of the first class. In the name of the medical profession we congratulate all these recipients of deserved honours.

BLOOD PRESSURE AND LIFE ASSURANCE.

THE observation of the arterial blood pressure in examinations for life assurance has of late years become common, especially in America; it is required by the medical forms of some companies, especially when the proposer is over 40 years of age. The value of the record is, nevertheless, uncertain; it is usually only the systolic pressure which is given and on a single occasion; the reading varies under manifold temporary influences, and it is difficult to distinguish between these and more permanent organic causes of altered pressure. Efforts have been made to place the practice on a firmer scientific basis. In 1911 statistics were published by Dr. J. W. Fisher of the mortality of persons with increased blood pressure accepted or declined by the North Western Mutual Life Insurance Company in the United States. These showed a greatly increasing death-rate when the systolic pressure was over 150 mm., but the period of observation was only four years. Dr. F. de Havilland Hall laid some similar records before the Medical Society of London in 1912.[1] Two recent meetings of the Assurance Medical Society in London, on March 7th and May 2nd, were occupied with an attempt to elucidate the pathology of increased pressure. Dr. H. Batty Shaw brought forward an elaborate study of 50 cases of persons dying in hospital from various diseases, in whom "hypertension"—i.e., systolic readings of 150 mm. or over—existed. Besides summaries of sex, ages, occupations, and symptoms, detailed reports of post-mortem examinations were given, especially of the kidney condition microscopically. Numerous charts of the pressure readings showed great variation from day to day, even in uniform hospital conditions, and in some an intermittency hard to explain. The author was led by his studies to regard hypertension as a disease of "pre-renal" site and origin, so far in seeming accord with the theory of Gull and Sutton, who placed the vascular disorder prior in time to that of the kidney. Sir Richard Douglas Powell regarded the two conditions as independent, though often associated, and Sir T. Clifford Allbutt pointed to cases in which there is simple increased blood pressure, while he would class the majority of high-tension cases as renal. Many points of interest were raised by other speakers, and the importance of the subject can hardly be exaggerated. In one group of instances alluded to by Dr. Hingston Fox increased pressure was held to be due to temporary causes, and such a condition is often toxic from alimentary or hepatic disorder. In life assurance work such cases should

[1] THE LANCET, 1912, i., 1406.

be postponed for a second examination after suitable treatment; mercurials, salines, and a restricted diet generally reduce the tension. A considerable range of blood pressure is consistent with good health. With some the systolic pressure is naturally high, and such persons may lose their sense of well-being if it falls below 140. There is, again, the subject with habitually low pressure, who is fain to get up and walk about his room to help him to think. In view of the natural rise with age, especially at the climacteric, a periodical testing after the age of 40 years would be a good practice. No decisive indication as to the effect of tobacco on blood pressure has been reached. In an extreme instance quoted by Dr. H. W. Collier, a man of 34 had smoked very largely since childhood: his systolic reading was only 98. The relative importance of systolic and diastolic pressures was raised by some speakers at the discussion before the Assurance Medical Society; records were submitted, and it was urged that the diastolic readings, indicating the minimal constant pressure in the artery, gave a truer indication of the strain upon the vessel, and were much less under the influence of posture, exercise, and emotion. Others objected that reliable diastolic readings were difficult to obtain. We may point out, however, that, thanks to the late George Oliver and to Professor MacWilliam, of Aberdeen, the auscultatory method has now been developed in a form easy to practise. Further observations are needed, and the influence of peripheral resistance, and the modern view of the stimulation of a weak ventricle by automatically induced increase of pressure must, among other factors, be taken into account. But it seems likely that diastolic pressure records will in the future attain increased importance for purposes of prognosis.

THE FOOD ALLOWANCE FOR BOYS AND GIRLS.

THE medical officer of health of Bristol City, Dr. D. S. Davies, has recorded a recent experience of revising the dietary of an institution for growing boys which has warned him that considerable life-long injury might be caused to boys and girls by insisting upon a too strict régime in their cases. Of course, the needs of the growing and developing individual are more important than those of the adult, and this point has already received official attention, for in one of the pamphlets published by the Ministry of Food it is rightly stated that children need plentiful food for three reasons: first, their surface is large compared with their weight; secondly, they are growing; and thirdly, they are almost always very active compared with many adults. It is generally conceded that a child of 8 needs half as much as a grown-up and a child of 12 three-fifths as much, while a girl of 16 needs as much as her mother and a boy of 16 may eat as much as his father. In these cases the foundations of fresh tissue for development are being laid down, and this goes on until the phase is reached of complete manhood and womanhood. Upon the conditions of nutrition of growing boys and girls depends the future physique and mentality of the race. Parents and guardians will do well to bear this in mind when the question of rationing juveniles is being considered. Food should not be dealt out to these in proportion to age, the children getting but a fraction of the dose for an adult. The parent must spare for the child.

THE MEDICINAL USE OF GLYCERINE.

THERE is now no glycerine being allotted for medicinal purposes, and pharmacists who have exhausted their supply can only obtain more by borrowing from those who have some left. As we noted four months ago the Ministry of Munitions considered that the stocks then in the hands of pharmacists should be sufficient to meet the legitimate demands of prescribers. An analysis of prescriptions undertaken by the *Chemist and Druggist* 30 years ago showed that glycerine came out ninth on the list of favourite drugs, and its use both in mixtures and as a toilet preparation has probably much increased since then. But neither as a solvent, a demulcent, or a flavouring agent is glycerine at all indispensable, and medical men would do well to assist the pharmacist in restricting its use to the few remaining purposes—perhaps in the case of calf lymph or in organo-therapeutic extracts—in which hardship would result from its withdrawal. It should hardly be necessary to point out that to prescribe glycerine freely in a lotion might place the conscientious pharmacist in a difficult position. He is prohibited by law from supplying it direct to one customer for toilet purposes, and it would be invidious for him to supply it to another customer for the same purpose on a medical man's order.

ANÆSTHETICS IN MILITARY PRACTICE.

THE adminstration of anæsthetics at or near the front was described recently in an admirable paper by Captain Geoffrey Marshall before the Section of Anæsthetics of the Royal Society of Medicine.[1] The author, in spite of the stress and hurry of a busy casualty clearing station, made scientific clinical observations on a number of cases, and his conclusions form a valuable addition to our knowledge of the factors that should indicate the choice of anæsthetics and the methods of administration in the exceptional conditions of shock, hæmorrhage, and septic toxæmia. Perhaps the most striking lesson which Captain Marshall draws from his observations is the danger of chloroform and of spinal analgesia in the presence of the combination of shock and recently produced anæmia. In civil practice we are familiar with the baneful effect which anæmia has in influencing the behaviour of the anæsthetised subject; when that anæmia is grave and recently produced the effect is so pronounced that the proper selection and administration of the anæsthetic may make the difference between life and death. The use of "gas and oxygen" or of warmed ether vapour should result in saving lives in these critical cases.

PREPAREDNESS.

THE April number of the *Military Surgeon* opens with a paper entitled "An Apostle of Preparedness," discussing the teaching of Lauder Brunton, and written, of course, before the United States had come into the war. The writer, Dr. Fielding H. Garrison, lieutenant in the Officers' Reserve Corps of the U.S. Army, addresses himself particularly to the volume of essays on physical and military training written by his old teacher in the last 17 years of his life. Brunton secured less popular support for his views than they deserved because he tried too openly to introduce

[1] THE LANCET, 1917, i., 615.

a disciplinary spirit into the games of children when the value of such a spirit was not apparent to a public living in a fool's paradise. His essays breathed a spirit of patriotic anxiety, and we can see now that their comprehension might have provided us with better recruits for the war, besides making the training of those recruits more even and freer from the occasional disasters which are noted clinically as "disordered action of the heart." Exercises, Brunton thought, should be generalised, those that educate only particular groups of muscles requiring to be corrected by games; and exercises should be only gradually increased lest over-exertion cause wasting of the muscles involved, impairment of the respiration, and strain and consequent weakness of the heart. He noted that the Russian recruit, when he left the army and returned to his village, could nearly always get 25 to 50 per cent. higher wages than the other young man who had not had his military training, and that in Switzerland, where only 75 per cent. of the young men were found fit for service, and only the best of these were selected for training, not to be accepted as a volunteer was regarded as a disgrace. This readiness and training for service may have saved Switzerland from disaster in the war.

THE DIAGNOSTIC CHARACTER OF EFFUSION IN MELANOTIC SARCOMA.

IN the *American Journal of the Medical Sciences* for May Dr. C. C. W. Judd has called attention to the diagnostic character of the effusion in melanotic sarcoma—an important point, as the diagnosis is often missed before an operation is performed. In two cases the usual characteristic signs—melanuria, pigmentation of the skin, or suspicious tumour of the skin or choroid—were absent, but fluid obtained by paracentesis showed almost identical appearances. When agitated it was quite opaque, even in thin layers. On standing, a dense, dark, brick-dust sediment formed, while the supernatant fluid, though intensely pigmented, was clear and of a dark reddish-brown colour. The surface layer was slightly iridescent, with a predominant greenish tone. The foam obtained by shaking had a tendency to a pinkish hue in the first case and to a dirty olive-green in the second. The supernatant fluid when tested with perchloride of iron gave no reaction for melanogen, but on addition of bromine water a yellow cheesy precipitate formed, which became much darker on standing, and finally black, indicating that the formation of melanin from melanogen had been completed during life. Tests for bile pigment were negative. Microscopically the sediment showed red corpuscles, epithelial cells, numerous leucocytes, and many tumour cells containing the typical pigmented granules of melanoma. In the first case the patient was a spinster, aged 40 years, who began to spit blood on May 1st, 1914, and to lose weight and strength. Examination on May 15th showed at both apices loss of resonance, prolongation of expiration, and numerous fine râles after coughing. Early tuberculosis was diagnosed. She was admitted to a sanatorium and her temperature seemed to confirm the diagnosis. She improved, but continued to expectorate sputum streaked with blood for eight months. The adventitious sounds largely disappeared. The sputum was repeatedly examined, but never showed tubercle bacilli or any cells suggestive of malignant disease. On Jan. 6th, 1915, she felt slight pain on the left side, and a few days later she felt a gurgle within the chest. Ten days later there was dullness at the left base with skodaic resonance above. Hydropneumothorax was diagnosed and puncture showed the effusion to be "bloody." On Feb. 13th paracentesis was performed to relieve pressure symptoms. The pleura at the sixth interspace in the axillary line was markedly resistant to the introduction of the needle. Twenty-four ounces of coffee-coloured fluid were removed. Reaccumulation necessitated repetition of the operation about every five days. The fluid obtained on Feb. 24th was the first to reach Dr. Judd, and had the characters given above. At the site of the first puncture a pigmented growth developed. Death occurred on April 6th. The necropsy showed melanoma of the lung. In the second case the patient was a very dark man, aged 34 years, who suffered from great abdominal enlargement. There was almost general dullness, which did not alter with posture, but fluctuation was elicited. Paracentesis yielded three litres of coffee-coloured fluid, with the characteristics given above. In the right upper quadrant a firm indefinite mass was then felt. Two days later the skin, which had been dark and slightly sallow, showed numerous small dark moles. As the patient was relieved he insisted on leaving hospital.

CHINA AND WESTERN MEDICINE.

IN calling attention a year ago[1] to the holding of the first annual conference of the National Medical Association of China, we predicted that progress was likely to be rapid. This opinion is confirmed by the report by our correspondent on p. 889 of the second conference held jointly with the China Medical Missionary Association, at which it was resolved to establish a central medical council for China with functions similar to those executed by our own General Medical Council—e.g., to fix a standard of medical education, to draw up a code of regulations, and adopt a uniform system of medical nomenclature. At the two sessions of the conference the presidents of the two associations—Dr. W. H. Venable, of Kashing, and Dr. Wu Lien-teh (known in this country as G. L. Tuck)—occupied the chair alternately. Much remains yet to be done in overcoming the prevailing conservatism of the Chinese in medical matters, which is in striking contrast with the receptivity of their Japanese neighbours. In the June number of the journal of medical missions, issued by the Church Missionary Society, Miss P. S. Tsêng, B.Sc., the first Chinese woman graduate of London University, speaks of the deeply-rooted prejudice of the Chinese against operations, a prejudice only overcome to any great extent in the coast provinces where the work of the missionary hospitals is seen and appreciated. She quotes an alarming figure for the incidence of tuberculosis in such a crowded centre as Hangchow, giving it by hearsay as 70 per cent. of the population. In view of this it is satisfactory to note the progress made in the opening of new hospitals and centres of medical work. The Central Hospital at Peking is to be opened in the coming September, the China Medical Board of the Rockefeller Foundation having entirely taken over responsibility for the Union Medical College with its annual budget of $53,000, and placing Dr. Franklin C. McLean, a

[1] THE LANCET, 1916, ii., 332, 336.

graduate of Chicago and Rush, at its head. The Board is also establishing a medical college in Shanghai, as well as offering liberal support to all missionary hospitals within easy reach of those centres in which medical schools exist. This enlightened policy of the China Medical Board, which also grants fellowships in the United States for graduates of Chinese medical colleges, cannot fail to have a beneficent influence on the development of Western medicine in China.

THE MINISTRY OF PUBLIC HEALTH.

WE understand that the Cabinet has favourably considered the scheme laid before it for the establishment of a Ministry of Public Health, and that the views of the Friendly Societies are to be taken on the subject. Whatever form the administrative centralisation of public health matters may assume, there is no reason to believe that the turning of the medical man into a State official will play an essential part in the scheme; but the general practitioner, whether in panel practice or no, will welcome any opportunity offered of making his point of view felt.

THE DISEASES OF ANIMALS DURING THE YEAR 1916.[1]

THE annual incidence of the diseases of animals is always of more than passing interest to the medical profession, as there are a number of diseases transmissible from animals to man. Rabies, anthrax, glanders, and mange may be cited as the principal ones, and statistics of their prevalence are given in the latest report of the Board of Agriculture and Fisheries. Rabies attracted attention this year by the occurrence at Oldham of a suspected case in a dog. Due precautions were taken, but it was eventually decided that the case was not one of rabies. The control of anthrax and glanders is now of especial importance on account of the large numbers of animals grouped together under war conditions, and the fact that no great outbreaks have occurred speaks volumes for the methods adopted by the Veterinary Department. Glanders especially, a disease which used to be the scourge of armies in war-time, is practically non-existent. If a case does occasionally occur, the weeding out by means of the mallein test is such a simple matter that the veterinarian has not now the slightest dread of this disease. Foot-and-mouth disease has given a little more anxiety, but the outbreaks were quickly got under control and the country is again free. The report concludes with tables of statistics.

Dr. A. E. Shipley, F.R.S., Master of Christ's College, Cambridge, has been elected Vice-Chancellor of the University for the year beginning Oct. 1st.

A MEETING of the Section of Medicine of the Royal Society of Medicine will be held on Tuesday next, June 12th, at 5.30 P.M., when Major Aldo Castellani will give a lecture, with lantern demonstration, on Tropical Diseases to which the Allied Troops are Exposed in the Balkanic Zone. We call the attention of our readers to a meeting which is sure to be of exceptional interest because the notice has been unavoidably very short.

[1] Annual Report of Proceedings under the Diseases of Animals Acts for 1916. Published by the Board of Agriculture and Fisheries at H.M. Stationery Office. 1917. Price 3d. net.

THE ANTISEPTIC "FLAVINE" (ACRIFLAVINE).

THE following has been officially communicated to the press by the Medical Research Committee:—

The incomplete statements which have appeared from time to time in the press with regard to the antiseptic "Flavine" have necessarily led to some misapprehension of the situation by the public. The impression has been created that flavine is a substance of magical potency which can cure infected wounds, and that there has been an unnecessary delay in making supplies of it available for general use. It should be realised that no antiseptic, even a theoretically ideal antiseptic when that is obtained, can ever be more than an adjunct to skilled and thorough surgery. Flavine must be thought of accordingly in relation to the other new antiseptics which have been brought into successful use during the course of the war.

These fall into two main classes. One depends upon the use of chlorine compounds, as in the well-known "Eusol" introduced by Edinburgh workers, the similar "Dakin" solution and the more recent chloramine-T, introduced by Dr. Dakin from the Leeds laboratories. These have wide use in our armies, and are now known all over the world. The researches from which these arose, and which are still in progress, have all been supported from the beginning by Government help through the Medical Research Committee. The second class, to which flavine belongs, includes the elaborate compounds of which most are brilliantly coloured and are used as dyes. From the first month of war special searches have been made among those on behalf of the Research Committee for unrecognised antiseptics of high value. Work at Haslar and at the London Hospital for the Committee showed very early the value of malachite green, and this is giving valuable routine results in naval hospitals and elsewhere. When it was desired to investigate flavine, which was a little-known but patented German dye, none was available in this country, and its manufacture requires highly skilled and laborious work. The Committee, however, caused a supply to be specially made in their Biochemical Department for investigation by Dr. Browning at the Bland-Sutton Institute. His remarks were first published in January, 1917. Three months previously, however, as a result of the first preliminary experiments, the Committee arranged that preparation should be made for the difficult processes of commercial manufacture, and all the scientific information at their command was made freely available. As a result of this early action they were able to supplement their own supply in use for the first laboratory experiments and clinical trials by a large number of samples, which were sent in April to a selected group of consultant surgeons to the Forces and other responsible surgeons for the purpose of securing official reports for the guidance of the Admiralty, the War Office, and civilian institutions, whose action could not rest upon any single testimony or any small-scale supply of the antiseptic. It is already clear that the special uses of flavine for particular purposes have still to be carefully defined in relation to other antiseptics and to the operative methods of surgery, to which it can at best only be a valuable aid. While this concerted official study is in progress two or three firms are already preparing for commercial supply to the public. Under our patent law it has been necessary for them to procure licence to manufacture from the Board of Trade. The hearing of applications for licences has already taken place, and it is hoped that licences to manufacture will very shortly be issued by the Board. It is proposed that all the manufacturing firms shall use one and the same name for the substance, a condition which will restrain any firm from securing monopoly privileges by wide advertisement of a fancy name. The Medical Research Committee have proposed for important technical reasons that the substance shall be officially called "Acriflavine" in this country. This will avoid the German name "Trypaflavin," which is registered as a trade-mark, and prevent confusion with an existing vegetable dye already called "Flavine." No doubt the firms concerned will announce at the earliest moment their readiness to supply acriflavine commercially.

During the progress of this work the Committee have more recently put at Dr. Browning's disposal for study a

compound closely allied to acriflavine which already appears to have identical or even superior properties, and if this be confirmed it will be easier to manufacture and cheaper for the public. This substance will be officially known as "Proflavine." An early scientific publication will be made on this subject.

The degree of Government support which has been given from the beginning to the researches upon acriflavine and other antiseptics has not always been made a matter of public knowledge. It is proper that financial and scientific help given officially should not diminish in any way the credit due to individual scientific workers or scientific institutions.

MEDICAL AFFAIRS IN CHINA.

(FROM OUR OWN CORRESPONDENT.)

The Peking Central (Model) Hospital.

AN important landmark in the progress of medical science in China is the approaching opening of the Peking Central Hospital next September. This hospital, when completed, will be the most up-to-date in the land, whether foreign or Chinese. The Government has supplied half the funds, and the other half has been obtained by public subscription. It will be managed by a Board of Trustees, whose qualification to office will be a subscription of at least a thousand dollars. The moving spirit of this deserving institution is Dr. Wu Lien-teh, who has travelled all over China and even as far as the Straits Settlements to enlist the support of wealthy Chinese. It is intended as a model in equipment and management, so that the thousands of officials who visit Peking may carry back with them some idea of the enormous advances which medicine has made in other parts of the world.

The hospital is a thoroughly modern structure, with central hot-water heating and the latest plumbing. The building is grey, with a red tile roof, and is beautifully situated, for from the roof garden of the west wing there is a lovely view over the hills, while from that of the east wing the renovated Mongolian pagoda of the Winter Palace and the temples of the Coal Hill are clearly visible. The whole building is of reinforced concrete, and is the only really fireproof structure in Peking. All the accommodation of a modern hospital is provided—that is to say, that in addition to the general and special wards, examination- and waiting-rooms, bathrooms and lavatories, and service block, there is a special-diet kitchen, analytical and bacteriological laboratories, private wards, and roof-garden shelters for heliotherapy and the restoration of convalescent cases.

Hong-Kong University.

At the first Convocation of the Hong-Kong University degrees were conferred for medicine, engineering, and arts. The most interesting part of the ceremony was the conferring of honorary degrees by the Governor of Hong-Kong, officiating as Chancellor. Of the five recipients of honorary degrees, two were Frenchmen and three Chinese. Both Frenchmen had contributed much to the knowledge of archæology in the Far East. The three Chinese were Sir Robert Hotung, a leading merchant in Hong-Kong, who among his considerable benefactions to the University founded the chair of clinical surgery; Mr. Jeme Tien Yow, a famous Chinese railway engineer; and Dr. Wu Lien-teh (G. L. Tuck).

The Resolutions of the Recent Joint Medical Conference.

I referred in my last letter to the two resolutions concerning the control of morphine and the institution of a Central Medical Council for China, passed by the Joint Medical Conference recently at Canton. I now send the text of these clear pronouncements.

The following is the resolution regarding the control of morphine:—

Whereas the National Medical Association and the China Medical Missionary Association, in joint conference assembled, have heard with deep concern of the enormous and rapidly increasing importation into China of morphine, and whereas such importation is largely surreptitious, therefore be it resolved that the National Medical Association and the China Medical Missionary Association place on record their conviction that the uncontrolled use of this drug will do far more harm to the nation than was ever done by opium, and believes that this imminent danger can only be averted by the Chinese Government enforcing without delay the provisions of the Hague Opium Convention of January 23, 1912 (including adequate pharmacy laws) so as to confine the employment of morphine to legitimate medicinal uses.

The following is the resolution regarding the formation of a Central Medical Council:—

Whereas during the Joint Conference of the National Medical Association and the China Medical Missionary Association great emphasis has been laid by the President of the National Medical Association on the need for a central organisation which shall regulate the curriculum and standards of medical schools throughout China, and shall control admission to the practice of Western medicine in this country; and whereas the experience of other countries has clearly shown that only by such centralised organisation can orderly progress be attained; and whereas the National Medical Association has expressed its belief that joint action in the matter is desirable at this time; therefore be it resolved, that this joint conference of the National Medical Association and the China Medical Missionary Association records its belief that only by the creation of a Central Medical Council can the needed regulation and control be effectively secured. Such council should include among its duties: 1. The fixation of a minimum standard of general education required of students before entering upon medical studies. 2. The maintenance of a student register on which the names of all who, having complied with the entrance requirements, have commenced the study of medicine shall be recorded. 3. The fixation of a minimum medical curriculum. 4. The supervision of examinations. 5. The recognition of hospitals where medical students and graduates may obtain clinical teaching. 6. The drawing up of laws and regulations affecting the medical profession in China, and their enforcement. 7. The issuing of a medical register containing the names of all those qualified to practise Western medicine in China. 8. The adoption of a general nomenclature of medical terms in Chinese. And further, that in view of the rapid increase in the number of students and practitioners of Western medicine in China, this conference requests the National Medical Association to approach the Board of Education with a view to the formation of such a council at an early date.

NATIONAL HEALTH INSURANCE.

The Public and Panel Practice in Birmingham.

IN our issue of May 19th we dealt with the comments of the London Panel Committee on the recent circulars D 8 and D 9 addressed by the British Medical Association to various bodies interested in the administration of National Insurance. In Birmingham a committee jointly appointed by the Panel Committee and the Executive Committee of the Central Division of the British Medical Association have arrived at conclusions not far differing from those formulated by the London Panel Committee. General satisfaction on the part of the insured is recorded, based upon evidence as to diminishing numbers of insured persons seeking medical advice as private patients, as to few changes of doctor at the end of each year, and few complaints coming before the Medical Service Subcommittee. The causes of dissatisfaction, where it exists, are stated to be principally lack of sufficient and appropriate examination, and insufficient attention, which cannot be wholly ascribed to war conditions—grounds of complaint which are admittedly serious when they are proved to occur. Certification difficulties and lack of uniformity in the procedure of different societies are also matters suggested for future reform. The medical man who is entirely devoted to panel work is said to give the most satisfaction to his panel patients. The number of general practitioners who have not joined the panel in the district under comment is about 80, as compared with about 260 who have done so. The report does not express any expectation that those now declining panel service would be induced to come in, even under the improved conditions which it considers practicable. A sufficiency of private practice, a dislike to being tied by contract, and lack of definition in the terms of contract and service are among the reasons assigned for this. It is noted that among those on the panel an improved panel service is generally considered likely to prove preferable to a salaried State service.

One of the questions propounded by the Insurance Commissioners is as follows:—

What extensions of the present provision in respect of medical benefit do you consider are required to make the service an adequate one?

The reply given is that the service will only be adequate when it provides for—

(*a*) A consulting or special opinion in necessary cases by a panel of consultants, who would see the insured persons in their own houses or at the consultant's rooms as occasion required. (*b*) Institutional in-patient treatment to be carried out by private practitioners in consultation with physician or surgeon, with operations by surgeons. (*c*) Complete service of necessary laboratory work for diagnosis, vaccines and serums, and X ray. (*d*) Nursing in their own homes by an amplified system of district nurses, which would allow

the continuous attendance of a nurse for short periods in suitable cases. (*e*) Dentistry, to include the provision of dentures. (*f*) Convalescent homes. (*g*) Instruction by lectures.

Among other suggestions made may be mentioned one that 2500 should be the largest number of patients permitted for any member of the panel, it being recognised at the same time that much depends upon the circumstances of a practice and upon the individual capacity of the practitioner. It is asked with regard to certification that uniformity in requirements as to the issue of certificates should be made compulsory upon all societies, and that in cases of chronic incapacity certificates at intervals of four weeks should be deemed sufficient.

The recording and comparing of opinions such as the above cannot fail to prove useful when the opportunity comes to amend the conditions of National Insurance, thus benefiting the insured person and the profession responsible for his health.

Obituary.

EMIL VON BEHRING,

EXCELLENZ; DIRECTOR OF THE INSTITUTE OF HYGIENE IN MARBURG.

Emil Behring was born at Hansdorf, in West Prussia, on March 15th, 1854, the day following the birth of his great compatriot, Paul Ehrlich. After qualifying in medicine at Berlin, he entered the Army Medical Corps, becoming in 1888 lecturer at the Army Medical College in Berlin, and it was not until he was 35 years of age that he became assistant at Koch's Institute for Infectious Diseases, undertaking as his first research the disinfecting properties of iodoform, which led his thoughts into the channels of problems of immunity. The bactericidal property of cell-free blood serum then claimed his attention, and especially the behaviour of serum in animals which had been exposed to the bacterial toxins which Roux had just described in Paris. Working alone on diphtheria toxin and in association with Kitasato on tetanus toxin, "the possibility of successfully treating cases of acute infectious disease" became the theme of a research published in the *Deut. med. Wochens.* in December, 1890, entitled "Über das Zustandekommen der Diphtherie-Immunität und der Tetanus-Immunität bei Tieren." Clinical experience, accumulated largely by Heubner, confirmed these experimental results, and at an address on the Aims and Achievements of Serum-therapy at the Naturalists' Congress in Lübeck (1895) Behring was justified in saying: "I have no fear that the thought which forms the basis of serum-therapy will ever disappear out of medicine." He estimated the probable saving of 75 per cent. of the mortality from diphtheria in Germany, an annual credit of 45,000 human lives. For this work Behring shared with Roux the 25,000-fr. prize of the Paris Academy of Medicine and the 50,000-fr. prize of the Institute of France. In 1901 he received the Nobel prize for Medicine, and delivered an address in Stockholm on Serum-therapy, while his progress in the receipt of official recognition at home reached the highest level of Excellency in 1903.

In 1895, when he was 41 years of age, Behring was appointed director of the Institute of Hygiene at Marburg, and from this time on he achieved nothing further corresponding to the five years of successful scientific work at Berlin. Ill-health already obliged him to give up the teaching function attached to the directorship and he only gave an occasional public lecture. He became financially interested in the manufacture of antitoxic serum by the Farbwerke Höchst which built and equipped admirable laboratories for him, in which he conducted researches involving, it is stated, 7,000,000 ounces of tubercle cultures. The bovo-vaccine which he devised for the immunisation of calves against tuberculosis formed the mainstay of another great commercial undertaking named the Behringwerk, and Behring was able to become a large landed proprietor with a population of cattle on which to test immunisatory processes under his own eye. Bovo-vaccine was also largely employed in Russia, Sweden, and America, with results which excited keen interest at the time, but which do not appear to have survived the test of time and prolonged experience. Behring himself, who started with the firm belief that human and bovine tubercle are one, had a period in which this conviction waned, and returned again to the unitarian view. "Phthisis," runs a much-quoted sentence, "is but the end of a lullaby sung at the cradle of the prospective consumptive." And whatever may have been the practical outcome of his experimental work there is no doubt that Behring has profoundly influenced contemporary thought in the direction of looking on tuberculosis as a lifelong affection. After suffering severely from periods of depression, von Behring's life was terminated by a sharp attack of pneumonia on March 31st, 1917.

JOHN MITFORD ATKINSON, M.B.LOND., M.R.C.S.ENG., L.S.A., D.P.H.CAMB.

John Mitford Atkinson died on May 23rd at his residence in West Kensington at the age of 60. The only son of the Rev. Samuel Atkinson, he received his early education at Queen's College, Taunton, proceeding thence to the London Hospital. As a student he had a successful career. He qualified M.R.C.S. Eng. and L.S.A. in 1878, taking the M.B. Lond. in 1881, and when home on leave from China, the D.P.H. Camb. in 1894. For a time he was assistant resident medical officer to the Kensington Infirmary, where he had for his senior colleague the late Henry Percy Potter. Here he learnt the details of management of a large medical institution, which later he turned to good account. In 1887 he was appointed superintendent of the Government Civil Hospital, Hong-Kong. At that time the hospital had no European staff of nurses, and its reputation was not at all high. He set to work to bring the administration of this hospital up to the professional level of the large general hospitals in London. At the beginning he had to face many difficulties, partly official and partly inherent in the local conditions and the prejudices of the Far East. All these difficulties he surmounted, and he succeeded in gaining the confidence, support, and esteem not only of his official colleagues but of the European and even the Chinese population of the Colony. One of his first efforts was to secure the appointment of nursing sisters. The official eye looked askance at the introduction of women into the hospital. After a time official consent was given, but the first ladies appointed had for their qualification the fact that they were members of a religious order. Excellent in many ways, they lacked professional training, and after a brief period Atkinson's advice was accepted and they were replaced by nurses who had been trained in hospitals in England. The hospital administration was gradually improved, and it established a well-earned reputation for its efficiency and excellent work. To this hospital were taken the sailors of the Russian cruiser *Varyag* wounded at the naval battle with the Japanese near Chemulpo. In acknowledgment of the professional services rendered then the Czar presented Mitford Atkinson with a gold cigarette-case ornamented with the Russian coat-of-arms in diamonds.

Mitford Atkinson's medical career can be traced in the reports to the Colonial Government on the Civil Hospital, and on the sanitary condition and administration of the colony of Hong-Kong. Indeed, these reports give the history of the continued sanitary progress of the colony. He held office at the time when plague made its appearance in epidemic form in the colony; the official reports which he wrote on this subject are classics in the literature of the disease. In 1897 he was promoted to the office of Principal Civil Medical Officer, but his connexion with the Government Civil Hospital was not severed. As chief of the Government Medical Department he exercised administrative control over the various civil hospitals of Hong-Kong. In 1903 he was appointed a member of the Executive and Legislative Council of Hong-Kong. In 1912 he retired on pension.

Shortly after the present war broke out, Mitford Atkinson received a commission in the Royal Army Medical Corps, and was granted the rank of major. He was given the task of converting the workhouse and infirmary at Richmond in Surrey into a war hospital. In this work he attained the success he had achieved in Hong-Kong. Possessed himself of indomitable enthusiasm, he had the gift of imparting this quality to others. He won the cordial support and active coöperation not only of the hospital staff but of the patients themselves. In addition, he secured the loyal support of the inhabitants of Richmond, proud of their excellent war hospital. In spite of warnings of a possible breakdown in health, he refused to relax the strain imposed on him by administrative control. Signs of angina pectoris appeared and progressed, and he was invalided out of the

Service, receiving a gratuity for the work he had done. After some months of complete rest he was contemplating again taking up professional work, but he died suddenly on May 23rd.

Certain of Atkinson's medical writings were published from time to time in THE LANCET, a lecture on Plague in 1901, and in 1903 a Case of Septicæmic Plague in a European, and Methylene Blue in the Treatment of Malignant Malaria; in 1909 a Possible Natural Enemy of the Mosquito, and in 1910 a contribution on the treatment of plague and an account of the climate of Hong-Kong. He was a Fellow of the Royal Colonial Institute, the Royal Sanitary Institute, and the Society of Tropical Medicine. He was a keen sportsman and an able exponent in many directions; he ran a dead heat for the amateur 100 yards championship, and played cricket to the end of his life. For a quarter of a century he occupied a prominent position in the medical world of the Far East. At his home all members of our profession were welcome guests when duty or pleasure took them to the colony of Hong-Kong. He married Clara, the eldest daughter of James Eastmond, of Puddington, Devon, and leaves a widow and two sons.

URBAN VITAL STATISTICS.

(Week ended May 26th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 14·1, against rates steadily declining from 18·5 to 14·3 per 1000 in the six preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 12·9, or 1·0 per 1000 less than in the previous week; among the remaining towns the rates ranged from 4·5 in Eastbourne, 5·5 in Edmonton, and 7·2 in Ealing, to 22·6 in West Bromwich, 23·1 in Rotherham, and 23·9 in Middlesbrough. The principal epidemic diseases caused 375 deaths, which corresponded to an annual rate of 1·2 per 1000, and included 238 from measles, 53 from whooping-cough, 42 from infantile diarrhœa, 29 from diphtheria, 12 from enteric fever, and 1 from scarlet fever. The deaths from measles were 13 below the average in the four previous weeks, and caused the highest annual death-rates of 3·9 in West Bromwich and in Sunderland, 4·3 in South Shields, 4·5 in Middlesbrough, and 5·8 in Rotherham. The 641 cases of scarlet fever and 1108 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 32 and 52 below the numbers remaining at the end of the previous week. Of the 4579 deaths from all causes in the 96 towns, 146 resulted from violence. The causes of 22 deaths were uncertified, of which 8 were registered in Birmingham, 4 in Liverpool, and 2 in St. Helens.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 16·1, against 15·9 and 17·0 per 1000 in the two preceding weeks. The 358 deaths from all causes in Glasgow corresponded to an annual rate of 16·7 per 1000, and included 35 from measles, 33 from whooping-cough, 5 from infantile diarrhœa, and 1 each from scarlet fever and diphtheria. The 102 deaths in Edinburgh were equal to an annual rate of 16·0 per 1000, and included 10 from measles, 8 from whooping-cough, and 3 from diphtheria.

Irish Towns.—The 151 deaths in Dublin were equal to a rate of 19·7, or 1·3 per 1000 above that recorded in the previous week, and included 5 from infantile diarrhœa, 3 each from measles and whooping-cough, and 1 each from enteric fever and scarlet fever. The 109 deaths in Belfast corresponded to an annual rate of 14·5 per 1000, and included a fatal case of enteric fever and 1 of infantile diarrhœa.

(Week ended June 2nd, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 12·7, against rates steadily falling from 18·5 to 14·1 per 1000 in the seven preceding weeks. In London the death-rate was 11·7, or 1·2 per 1000 less than that recorded in the previous week; among the remaining towns the rates ranged from 3·1 in Aberdare, 4·8 in Ealing, and 6·3 in Merthyr Tydfil, to 20·5 in South Shields, 23·0 in Sunderland, and 31·1 in Middlesbrough. The principal epidemic diseases caused 366 deaths, which corresponded to an annual rate of 1·1 per 1000, and included 245 from measles, 43 from infantile diarrhœa, 41 from whooping-cough, 26 from diphtheria, 7 from scarlet fever, and 4 from enteric fever. The deaths from measles were 7 in excess of the number in the previous week, and caused the highest annual death-rates of 4·9 in Rotherham, 5·0 in Sunderland, 5·2 in South Shields, and 8·6 in Middlesbrough. The 626 cases of scarlet fever and 1061 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 15 and 47 below the numbers remaining at the end of the previous week. Of the 4126 deaths from all causes in the 96 towns, 125 resulted from violence. The causes of 40 deaths were uncertified, of which 6 were registered in Birmingham and 3 each in Stoke-on-Trent, Manchester, and Gateshead, but not one in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 16·0, against 17·0 and 16·1 per 1000 in the two preceding weeks. The 382 deaths in Glasgow corresponded to an annual rate of 17·9 per 1000, and included 39 from measles, 38 from whooping-cough, 3 from infantile diarrhœa, and 1 each from scarlet fever and diphtheria. The 102 deaths in Edinburgh were equal to an annual rate of 16·0 per 1000, and included 18 from measles, 6 from whooping-cough, 2 from diphtheria, and 1 from scarlet fever.

Irish Towns.—The 145 deaths recorded in Dublin were equal to an annual rate of 18·9, or 0·8 per 1000 less than that recorded in the previous week, and included 4 from measles, 2 from infantile diarrhœa, and 1 from scarlet fever. The 115 deaths in Belfast corresponded to an annual rate of 15·3 per 1000, and included 2 from scarlet fever and 1 each from enteric fever and measles.

Correspondence.

"Audi alteram partem."

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—The symptomatology of heart disease has undoubtedly its importance in regard to both diagnosis and prognosis, but it is equally true that most, if not all, of the symptoms that may be found attendant upon various diseases of the heart are frequently to be met with in those whose hearts are sound, and, on the other hand, many persons with serious organic heart disease do not complain of any symptoms. One may meet, for instance, with persons with very pronounced aortic regurgitation and others with very definite mitral stenosis (of the pure funnel variety) leading active lives for many years without presenting symptoms. Most of the symptoms connected with the heart are, indeed, of the nature of functional disturbance rather than organic embarrassment, and in my Lumleian lectures (p. 9) I endeavoured to classify them under the headings of (1) malnutrition, defective metabolism, morbid blood stream, functional overstrain as affecting the cardio-vascular muscle; (2) toxic influences, reflex excitation or depression, direct excitation or depression as affecting the cardio-vascular innervation; but I am careful to point out (p. 22) "that functional disturbance is as frequently observed in association with diseased as with healthy hearts and that many of the troubles and some of the catastrophes of cardiac disease are attributable to functional derangements." The criterion in either case, both from the treatment and prognosis points of view, is to be derived only from an estimation of the condition of the heart by physical examination.

I do not for a moment suppose that in practice Sir James Mackenzie would fail to attach all due importance to auscultative and other instrumental diagnosis of heart disease as well as to the consideration of symptoms. He has, as we know, much strengthened our methods in these respects, and his work has met with well-merited appreciation; but the trend of his advocacy at the moment seems to be to invert in order of importance the symptomatic and physical methods of diagnosis, and thus to misguide those who may be less experienced.

When Sir James Mackenzie observes that we should watch each individual case of heart disease throughout his life he speaks but an obvious truth, the only question being as to the opportunity of doing so; and when he adds that the danger lies not in the damaged valve but in the heart not being able to overcome successfully the embarrassment to its work caused by the damaged valve, he states another truism although in inverted order, for the danger is there all the time. It can be foreseen and estimated by careful consideration of the physical signs; when the symptoms of heart failure present themselves compensatory function is already failing. Let me give what I venture to regard as a model report on a case of heart disease for diagnosis and prognosis (the note is not mine, but came before me a few days ago).

An applicant for life assurance is reported to have had two attacks of rheumatism, the last seven years previously; he has an aortic diastolic and a mitral systolic murmur. What are the chances of his longevity? In other words, what is the probable term at which the heart will no longer be able to overcome the embarrassment to its action? In this view the able physician in the case proceeds to point out that the murmurs in either case do not completely replace the valve sound, the heart's action is regular at 78, it shows only a moderate degree of hypertrophy; further, the pulse, although deliberate, has not the collapsing characters of marked aortic regurgitation, and the blood pressure is well maintained at 140. It will thus be observed that we have the valve lesions indicated, the duration of the lesions given, the degree of valve defect shown in the character of the sounds, the power of the heart in overcoming its difficulties shown in the steady, quiet pulse and moderate enlargement, the output of the whole mechanism shown in the normal blood pressure. Is not this a masterly exposition of the facts of the case upon which a sound estimate of the cardiac condition may

be formed and advice given calculated to postpone the symptoms of failure?

Sir James Mackenzie's generous admission that "the older physicians did their work according to their lights as we do ours according to our lights," makes one hopeful that he at least has not yet joined the "reaction-aries," which his reference to the work of Dr. Poynton led me to fear that he might have done.

In this letter I have in mind especially valvular defects and their results upon the heart, which appear to be in question in the present correspondence.

I am, Sir, yours faithfully,

Portland-place, W., June 5th, 1917. R. DOUGLAS POWELL.

To the Editor of THE LANCET.

SIR,—I take second place to no one in my admiration of the work that Sir James Mackenzie has done in connexion with the investigation of diseases of the heart, and were I equally in accord with his controversial methods, it would not be necessary for me to trouble you with this letter. Sir James Mackenzie is a merciless critic from his own point of view of other people's views on cardiac and circulatory disorders, more especially if these happen to belong to what may be styled the old-fashioned type of clinical physician. In the process of pulverising his chimerical opponents he has expended a great deal of energy in flogging tired horses, in tilting at tattered windmills, and in razing to the ground tottering pathological structures which have respectively been flogged, tilted at, and razed to the ground on many previous occasions by many different writers. Clinical heresies no doubt die hard, and it may perhaps be just as well to ensure that they are really dead by killing them more than once! It is, however, quite another matter when in THE LANCET of May 26th Sir James Mackenzie directly challenges Dr. A. Morison to produce evidence of a single instance where he has given with clearness and precision a description of how murmurs can be differentiated to show those that are innocent and negligible from those that imply danger. Furthermore, he asks where, in Dr. Morison's own writings or in the writings of others, the principles for assessing the value of murmurs are indicated. Now, I hold no brief for Dr. Morison, and so hardy a campaigner in the field of cardiac dialectics can safely be left to take care of himself. But I must confess to no small amount of astonishment that hitherto no one has come forward to meet and answer this challenge on behalf of the older school of cardiac clinicians. It is with some diffidence that I feel compelled to undertake the responsibility of making at least some sort of reply to so provocative an inquiry; conscious as I am of my inability to do full justice to the theme, and knowing full well that I shall be accused of attempting to bolster up a lost cause.

Under the influence of Sir James Mackenzie's writings I was under the impression that medical opinion had hardened in the direction of paying relatively less attention to physical signs, including murmurs, and of giving more weight to symptoms and other indications of the condition of the cardiac wall in the investigation and diagnosis of diseases of the heart. Do I understand him aright when I assume that the observations in his letter of May 26th are an attempt to restore the tarnished splendour of physical signs, including murmurs, to their ancient diagnostic glory? I am quite ready to admit that the older writers may have attached too much significance to cardiac murmurs, and in so doing they no doubt neglected other features of greater value in the elucidation of disorders of the heart. Indeed, Sir, in this connexion I should be prepared to quote from authors on diseases of the heart written during the last 50 years material on the significance of murmurs sufficient to fill a whole issue of your valuable paper! I will content myself by quoting two instances which will suffice to illustrate my contention. Is Sir James Mackenzie conversant with the writings of my late chief, Sir William Broadbent? I put it to him that Broadbent's observations on the significance of the presystolic and diastolic murmurs of mitral stenosis are as nearly abreast of modern cardiology as anything that has been written. Again, I would call attention to George Balfour's observations on the mitral systolic murmur associated with "curable mitral regurgitation," and ask if no attempt has been made by past masters of clinical medicine to define the significance of cardiac murmurs? Surely Sir James Mackenzie must admit that, with all their faults, the older generation of clinical physicians did not hesitate to grapple with the interpretation of cardiac murmurs and endeavour to explain their significance. They may not have solved the problem, but at least they attempted to do so.

The tendency in the past to consider the different manifestations of a so-called disease in separate compartments has led to much confusion and error. It is essential to the full comprehension of cardiac as well as of other disorders that disease should be looked upon as a *process* beginning with functional disturbance and terminating in gross structural change. The whole series of events correlated with the progressive degradation of function and structure must be recognised and appreciated in all their bearings before it can be said that we understand the nature of any disease.

I am, Sir, yours faithfully,

Upper Berkeley-street, W., June 4th, 1917. E. H. COLBECK.

SHELL WOUNDS IN CHILDREN.

To the Editor of THE LANCET.

SIR,—During the earlier days of the war many children were wounded by shells, bombs, &c., in the towns and villages at the back of the firing line. To deal with these cases a civilian hospital was established in Belgium, situated at first in a town, and later removed to an adjoining field for greater safety. It was composed of long wooden barrack sheds or huts, with a good operating theatre and X ray instalment, and was staffed with Belgian nurses. Cases were brought in by ambulances from the country round, adults as well as children, sometimes very early, and at other times after a good interval had elapsed since the injury. The conditions of treatment being the same for adults and for children, one was able to compare the results of these two classes of case in their response to the treatment received. Unfortunately, partly from lack of assistance, and partly from absence of the facilities for bacteriological work, many notes of value were not kept.

Although other forms of treatment were tried, ordinary principles of surgery were mainly used, and consisted of—(*a*) prompt localisation and removal of all foreign bodies; (*b*) thorough drainage of wounds before, if possible, acute sepsis had set in; (*c*) daily irrigation of wounds with eusol. A general anæsthetic—viz., chloroform induction and warm open-ether sequence—was used in each case. The following serve to show the type of case treated:—

CASE 1.—Boy, aged 11, admitted with shell wound through back of thigh, completely fracturing the shaft of femur about the middle. The metal lodged in front of the bone. He was admitted within a few minutes of the accident. The fragment was at once located and removed by an anterior incision which was sutured and healed by first intention. Good drainage was established by a rubber tube from behind, and the limb put on a Hodgen splint and daily irrigated with eusol. In three weeks the wound was healed, and there was sufficient union of bone to enable all splints to be removed. The temperature was normal after the first three days, and after his sixth week he left hospital on foot carrying his own bundle.

CASE 2.—Girl, aged 10, with badly comminuted compound fracture of thigh by a shell. She was not seen for 10 days, and the missile had been removed elsewhere. After a mild septic course of about two months union was complete, though with much shortening and no necrosed bone came away.

CASE 3.—Girl, aged 12. A large fragment of shell penetrated the skull in the mid-frontal region. She was brought in at once, bleeding considerably from the median sinus. The metal and loose pieces of bone were at once removed, and had penetrated at least one and a half inches in depth. All injured dura was exposed by clipping away more bone. Some brain matter and hair escaped. The wound was packed with gauze for 24 hours. A cerebral hernia followed about the size of a hen's egg. This was dressed for a week with alcoholic compresses. The hernia disappeared in about six weeks, with no after-symptoms of cerebral injury. The temperature was practically normal throughout.

CASE 4.—Boy, aged 3, with shell wound in buttock near anus penetrating to a depth of about 2 inches (in adults not a favourable position). He was seen after 48 hours and the metal was removed literally wrapped in a piece of his coat. The wound healed in about two weeks. The temperature was rather high, but fell to normal at once after operation.

CASE 5.—Boy, aged 10, was playing with a hand grenade which exploded. He was not seen for 24 hours. He lost part of his thumb and received a compound split in the left tibia and an injury of the right knee opening into the joint. The wounds were trimmed and partly sutured and prolapsed muscle cut away. The knee-joint was irrigated with saline, a piece of cloth coming away. The missile had escaped. The capsule was completely sutured and the external wound closed around a gauze drain down to the capsule. The last I saw of him he was running down the road just under a month from the time of injury and all wounds healed.

Children as a class cannot by any means be considered immune from microbic infection, yet compared with the adults who were treated on exactly the same lines children did not exhibit sepsis to anything like the same degree, and their wounds consequently healed quicker. These children were certainly no cleaner than their parents, and their clothes

were often very dirty. It is possible that the smoothness of a child's skin has a good deal to do with this freedom from severe sepsis, and pathological germs reside in the pores and folds of the skin (which are more marked in adults) rather than in the dust and clothes. Psychological effects of explosives on the minds of the younger children admitted were very slight or absent, and they did not show symptoms of fear during air-raids or bombardments to anything like the same degree as did the adults, perhaps partly from want of realisation. As one more illustrative case the following may be given :—

A woman was walking in the street of a well-known Belgian town and her small child with her. The mother was killed on the spot by a bursting shell, and the child seemed wonderfully unconcerned when I saw it a few minutes later. It was not injured.

Finally, it might be added that hæmorrhage entered into prognosis in children before shock, and one or two cases were lost from that alone.

I am, Sir, yours faithfully,

A. H. FARDON,
Medical Officer in Charge.

Headquarters, F.A.U., B.E.F., May, 1917.

THE ETIOLOGY OF GANGOSA AND ALLIED CONDITIONS.

To the Editor of THE LANCET.

SIR,—In the *Annals of Tropical Medicine and Parasitology*, issued by the Liverpool School of Tropical Medicine, Vol. IX., No. 2, dated June, 1915, a description is given by Dr. Anton Breinl, of the Australasian Institute of Tropical Medicine, of gangosa, or rhinopharyngitis mutilans, and of certain forms of osteitis, periostitis, ulcus tropicum, ulcus interdigitale, and of certain forms of leucoderma. These cases are beautifully illustrated by the most excellent photographs. Dr. Breinl considers gangosa to be a separate disease due to an organism named by him *Cryptococcus mutilans*.

We would like to point out that all the above conditions occur frequently in Fiji, especially amongst the Fijians and half-castes, but also amongst Indians and Europeans who have long resided in Fiji. These diseases always are preceded by primary or secondary yaws, and they yield in their active stages to the same remedies as other forms of tertiary yaws, with which they are frequently associated. Medical men in Fiji, having a very large experience of yaws, invariably regard these manifestations as tertiary stages of frambœsia.

We are, Sir, yours faithfully,

PHILIP HARPER,
District Medical Officer, Fiji.
G. W. A. LYNCH, M.B.,
Chief Medical Officer.

March 5th, 1917.

TRENCH SHIN.

To the Editor of THE LANCET.

SIR,—Lieutenant-Colonel Graham Chambers's contribution in THE LANCET of May 19th to the study of that condition known as "trench shin" is of great interest. Whatever the etiology may be, it appears to be generally agreed that fibrositis is the cause of the pain. I have not had an opportunity of seeing these cases in their early stages, but have been called upon to treat many of them from the third week onwards. In the early cases I should be strongly inclined to use salicylate ionisation, but in those I have met I have found the most beneficial results from the sinusoidal current applied rhythmically (Lewis Jones interrupter) with the legs in Schnée baths. Patients tell me they experience great relief and can rest and sleep much better after the treatment, which is given for 20 minutes at a time on alternate days. No doubt the rhythmical contractions of the muscles favour the circulation and elimination of waste products, and I should expect similarly good results from the condenser arrangement devised by the late Dr. Lewis Jones and described by myself in the *Practitioner*, December, 1916. In this, by means of a motor interrupter, a condenser is alternately charged from the main and discharged through the primary of a coil, the patient being connected to the secondary. The current is applied rhythmically and has the advantage of giving powerful motor contractions with a very small sensory effect.

I am, Sir, yours faithfully,

L. W. BATHURST.

Harley-street, W., June 4th, 1917.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Wounded.

Capt. F. M. Hughes, R.A.M.C., attached London Regiment.
Capt. G. Thomson, R.A.M.C., attached London Regiment.
Lieut. L. C. G. Bacon, R.A.M.C.
Lieut. T. Burrell, R.A.M.C.
Capt. F. R. Thornton, M.C., R.A.M.C.
Maj. N. J. Bullen, Australian A.M.C.
Capt. E. R. Mackay, Australian A.M.C.

Previously reported Missing, feared Killed, now reported not Missing.

Surg.-Prob. A. G. Lennox-Browne, R.N.V.R.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who are reported to have fallen during the war:—

Lieut. A. Mantle, London Regiment, younger son of Dr. A. Mantle, of Harrogate.
Capt. H. E. R. Hamilton, Canadian Railway Troops, elder son of Dr. H. T. Hamilton, of Barnes, London.
Lieut. E. H. Hopkinson, M.C., Cambridge Regiment, second son of Dr. A. Hopkinson, of Withington, Manchester.
Lance-Corp. H. M. Dockrell, Duke of Cornwall's L.I., youngest son of Dr. M. Dockrell, of Cavendish-square, London.
Second Lieut. W. G. M. Britton, Royal Flying Corps, fourth son of the late Dr. J. Britton, J.P., of Strabane, co. Tyrone.
Second Lieut. H. H. Ezard, Royal Flying Corps, elder son of Dr. E. H. Ezard, of Cambridge.

[We are glad to learn from Dr. G. T. Eccles, of Hove, that his son, Second Lieut. H. E. R. Eccles, of the Royal Flying Corps, is not dead, as reported, but is severely wounded, and is now in the Royal Flying Corps Hospital at Eaton-square, London.]

THE HONOURS LIST.

The following awards to and promotions of medical officers, for services in the field or for services in connexion with the war, are announced, on the occasion of the King's Birthday :—

K.C.B.

Col. J. Magill, C.B. (ret. pay); Lt.-Col. P. J. Freyer, C.B., I.M.S., ret.

C.B.

Surg.-Gen. G. Welch, R.N.; Fleet-Surg. J. Menary, R.N.; Temp. Surg.-Gen. Sir W. Macewen, R.N.; Temp. Surg.-Gen. G. R. Turner, R.N.; Col. R. Kirkpatrick, C.M.G., A.M.S.; Col. C. H. Burtchaell, C.M.G., A.M.S.; Col. J. J. Gerrard, A.M.S.; Temp. Col. W. H. Willcox, C.M.G.; Lt.-Col. (temp. Col.) G. W. Brazier-Creagh, C.M.G. (ret. pay), late R.A.M.C.; Lt.-Col. (temp. Col.) H. S. Thurston, C.M.G., R.A.M.C.; Lt.-Col. and Bt.-Col. Sir B. G. Seton, Bart., I.M.S.; Col. D. Wardrop, C.V.O. (ret. pay), A.M.S.; Col. C. R. Tyrrell (ret. pay), A.M.S.; Temp. Col. J. Galloway, A.M.S.; Surg.-Lt.-Col. (Hon. Surg.-Col.) R. J. Reece, H.A.C.; Surg.-Lt.-Col. Sir W. R. Crooke-Lawless, C.I.E. (ret. pay), R. of O. (empld. R.A.M.C.); Maj. and Bt.-Lt.-Col. (temp. Brig.-Gen.) A. C. Geddes, Unattd. List.

K.C.M.G.

Surg.-Gen. Sir A. T. Sloggett, K.C.B., C.M.G., K.H.S.; Surg.-Gen. F. H. Treherne, C.M.G.; Surg.-Gen. T. P. Woodhouse, C.B.; Col. R. N. Campbell, C.B., C.I.E. (ret.), I.M.S.

C.M.G.

Fleet-Surg. G. T. Bishop, R.N.; Col. C. C. Manifold, C.B., I.M.S.; Col. D. M. O'Callaghan, A.M.S.; Col. A. W. Bewley, A.M.S.; Lt.-Col. (temp. Col.) F. J. Greig (ret. pay), R. of O., late R.A.M.C.; Lt.-Col. G. Scott (ret. pay), late R.A.M.C.; Lt.-Col. A. Hosie (ret. pay), late R.A.M.C.; Lt.-Col. (temp. Col.) J. C. Connor, R.A.M.C.; Temp. Lt.-Col. A. D. Milne, East Afr. Med. Serv.; Maj. (temp. Lt.-Col.) R. J. C. Thompson, D.S.O., R.A.M.C.; Col. R. E. Roth, D.S.O., Austr. A.M.C.; Lt.-Col. T. H. Sweeny (ret.), I.M.S.; Lt.-Col. F. F. Perry, C.I.E. (ret.), I.M.S.; Lt.-Col. J. Chaytor-White (ret.), I.M.S.; Lt.-Col. S. B. Smith, I.M.S.; Lt.-Col. J. N. MacLeod, C.I.E. (ret.), I.M.S.; Lt.-Col. D. Harvey, R.A.M.C.; Temp. Hon. Lt.-Col. M. H. Gordon, R.A.M.C.; Maj. P. S. O'Reilly, R.A.M.C.; Maj. G. A. D. Harvey, R.A.M.C.; Temp. Maj. A. D. Reid, R.A.M.C.; Col. R. J. Millard, Austr. A.M.C.; Lt.-Col. W. T. Hayward, Austr. A.M.C.; Lt.-Col. T. E. V. Hurley, Austr. A.M.C.; Col. C. A. Hodgetts, Canad. A.M.C.

C.I.E.

Capt. H. H. Thorburn, I.M.S.

Surgeon-General.

Col. (temp. Surg.-Gen.) W. W. Pike, C.M.G., D.S.O.

Brevet-Colonels.

Lt.-Col. S. L. Cummins, C.M.G., R.A.M.C.; Lt.-Col. (temp. Col.) G. T. K. Maurice, C.M.G., R.A.M.C.

Brevet-Lt.-Colonel.

Maj. P. H. Henderson, D.S.O., R.A.M.C.

Brevet-Majors.

Capt. D. M. Corbett, R.A.M.C.; Capt. (actg. Lt.-Col.) B. Johnson, R.A.M.C.; Capt. H. F. Panton, M.C., R.A.M.C.

D.S.O.

I.M.S.—Lt.-Col. H. J. K. Bamfield; Maj. E. T. Harris; Lt. N. S. Jatar; Capt. A. N. Thomas; Maj. C. H. Watson.

R.A.M.C.—Maj. (temp. Lt.-Col.) D. Ahern; Lt.-Col. (temp. Col.) J. D. Alexander; Temp. Capt. P. H. Babr; Lt.-Col. (temp. Col.) A. W. N. Bowen; Maj. R. H. Bridges; Capt. F. Casement; Capt. (actg. Lt.-Col.) H. K. Dawson; Maj. (temp. Lt.-Col.) B. H. V. Dunbar; Temp. Capt. J. J. Dwyer; Capt. (actg. Lt.-Col.) P. G. M. Elvery, M.C.; Lt.-Col. H. B. Fawcus, C.M.G.; Capt. (actg. Lt.-Col.) A. D. Fraser, M.C.; Maj. G. B. Gask; Lt.-Col. (actg. Col.) J. G. Gill; Lt.-Col. G. H. Goddard; Capt. J. Golding; Temp. Maj. (temp. Lt.-Col.) E. L. Gowlland (late Maj., R.G.A., T.F.); Maj. (temp. Lt.-Col.) G. H. L. Hammerton; Lt.-Col. (actg. Col.) H. Herrick; Maj. (temp. Lt.-Col.) H. C. Hildreth; Lt.-Col. C. H. Howkins; Maj. (temp. Lt.-Col.) W. D. C. Kelly; Capt. H. Lightstone, M.C.; Capt. (actg. Lt.-Col.) A. S. Littlejohns; Temp. Lt.-Col. D. D. Logan; Lt.-Col. (temp. Col.) P. MacKessack; Capt. (actg. Lt.-Col.) G. Mackie; Capt. (actg. Lt.-Col.) R. Magill; Temp. Capt. J. R. Marrack, M.C.; Lt.-Col. E. W. P. V. Marriott; Maj. (temp. Lt.-Col.) J. Matthews; Capt. (actg. Lt.-Col.) C. R. M. Morris; Capt. (actg. Lt.-Col.) K. D. Murchison; Capt. (actg. Lt.-Col.) A. D. O'Carroll; Lt.-Col. (temp. Col.) S. de C. O'Grady; Maj. J. S. Pascoe; Maj. (temp. Lt.-Col.) J. E. Powell; Maj. (temp. Lt.-Col.) T. P. Puddicombe; Lt.-Col. (temp. Col.) M. M. Rattray; Maj. J. D. Richmond; Maj. (temp. Lt.-Col.) H. Rogers; Maj. (temp. Lt.-Col.) D. Rorie; Temp. Capt. (actg. Lt.-Col.) L. D. Shaw; Maj. G. F. Sheehan; Maj. S. B. Smith; Capt. (actg. Lt.-Col.) G. H. Stevenson; Maj. (temp. Lt.-Col.) H. Stewart, M.C.; Capt. (actg. Lt.-Col.) M. R. Taylor; Capt. (temp. Maj.) R. S. Taylor; Maj. J. A. Turnbull; Temp. Capt. R. B. Wallace; Lt.-Col. A. H. Waring; Capt. (actg. Lt.-Col.) A. G. Wells; Maj. (temp. Lt.-Col.) R. M. West; Maj. W. J. Weston; Lt.-Col. E. A. Wraith; Maj. (temp. Lt.-Col.) T. J. Wright.

Australian A.M.C.—Lt.-Col. H. N. Butler; Maj. G. C. Byrne; Maj. G. E. Cole; Lt. Col. (temp. Col.) C. T. C. De Crespigny; Maj. W. A. Fraser; Lt.-Col. (temp. Col.) W. W. Hearne; Lt.-Col. (temp. Col.) R. B. Huxtable; Maj. C. L. S. Macintosh; Capt. A. H. Powell; Lt.-Col. A. H. Tebbutt; Maj. R. W. W. Walsh; Maj. H. L. St. V. Welch.

Canadian A.M.C.—Maj. R. M. Gorsaline; Lt.-Col. W. B. Hendry; Maj. J. S. Jenkins; Lt.-Col. C. F. McGaffen; Lt.-Col. J. D. McQueen; Lt.-Col. C. P. Templeton; Lt.-Col. E. J. Williams.

New Zealand M.C.—Maj. T. D. M. Stout.

South African M.C.—Lt.-Col. R. L. Girdwood; Maj. (acting Lt.-Col.) R. N. Pringle; Lt.-Col. H. W. Vaughan-Williams.

Military Cross.

I.M.S.—Capt. A. N. Dickson.

R.A.M.C.—Temp. Capt. G. O. F. Alley; Capt. L. B. Baird; Capt. J. H. Bayley; Temp. Capt. J. H. Box; Capt. R. A. Broderick; Temp. Capt. J. V. Brown; Temp. Capt. L. G. Brown; Capt. A. E. Bullock; Temp. Capt. E. R. C. Cooke; Capt J. M. A. Costello; Capt. G. Dalziel; Lt. R. Ellis; Capt. W. T. Gardiner; Temp. Capt. N J. H. Gavin; Capt. W. George; Temp. Capt. D. Hardie; Capt. P. Hartley; Capt. A. S. Heale; Temp. Capt. J. T. Hurst; Capt. L. H. W. Iredale; Temp. Capt. A. Jones; Temp. Capt. D. Kelly; Capt. D. R. King; Temp. Capt. G. N. Lorimer; Temp. Capt. J. T. MacKenzie; Capt. J. C. Metcalfe; Temp. Capt. H. J. Milligan; Capt. J. R. Mitchell; Temp. Capt. H. Moore; Capt. R. E. U. Newman; Capt. M. W. Patterson; Temp. Capt. A. S. Plant; Temp. Capt. R. A. W. Proctor; Capt. J. P. Quinn; Temp. Capt. W. K. A. Richards; Capt. D. J. Scott; Capt. C. F. Searle; Temp. Capt. A. D. Sharp; Temp. Capt. H. S. Sugars; Capt. O. Teichmann; Temp. Capt. W. B. Wamsley; Capt. L. T. Whelan; Capt. J. St. G. Wilson.

Australian A.M.C.—Capt. H. W. F. Mitchell; Capt. G. S. Robinson; Capt. C. T. Turner; Capt. F. L. Wall.

Canadian A.M.C.—Capt. A. C. C. Johnston; Lt. (temp. Capt.) C. G. Sutherland; Capt. W. G. Turner; Capt. R. H. M. Hardisty.

New Zealand M.C.—Capt. A. V. Short.

South African M.C.—Capt. R. P. McNeill.

Egyptian Army M.C.—Yuzbashi Wadid Effendi Tanuis Ghusn.

Rhodesian Medical Service.—Surg.-Capt. E. G. Storrs.

MENTIONED IN DESPATCHES.

The names of the following medical officers mentioned in Sir Douglas Haig's despatch are additional to those published in THE LANCET of June 2nd, p. 856:—

Australian Army Medical Corps.—Col. G. W. Barber, D.S.O.; Lt.-Col. (temp. Brig.-Gen.) W. W. Hearne; Lt.-Col. (temp. Col.) R. B. Huxtable; Maj. L. W. Jeffries, D.S.O.; Maj. J. J. Nicholas; Col. A. Sutton, C.M.G.; Maj. A. S. D. Barton; Lt.-Col. H. N. Butler; Maj. G. C. Byrne; Lt.-Col. J. Corbin; Lt.-Col. C. T. de Crespigny; Capt. M. J. Holmes; Capt. (temp. Maj.) A. O. Howse; Maj. J. P. Kenny; Capt. N. E. B. Kirkwood; Maj. E. F. Lind; Maj. G. W. Macartney; Capt. J. McCusker; Maj. C. L. S. Macintosh; Capt. I. Morgan; Capt. A. H. Powell; Capt. S. A. Railton; Col. R. E. Roth, D.S.O., V.D.; Lt.-Col. H. S. Stacy; Capt. H. O. Teague (killed); Lt.-Col A. H. Tebbutt; Maj. C. W. Thompson, M.C.; Maj. R. W. W. Walsh; Maj. H. L. St. V. Welch; Capt. G. C. Willcocks; Lt.-Col. M. I. Williams (died of wounds); Maj. A. M. Wilson.

Canadian Army Medical Corps.—Maj. R. M. Gorsaline; Maj. J. S. Jenkins; Lt.-Col. C. P. Templeton; Maj. A. T. Bazin; Maj. P. G. Bell; Capt. T. H. Bell; Capt. H. Buck; Lt.-Col. K. Cameron; Capt. J. C. Clarke; Maj. C. H. Dickson; Lt.-Col. J. M. Elder; Capt. A. W. M. Ellis; Col. J. T. Fotheringham, C.M.G.; Maj. A. L. C. Gilday; Capt. D. B. Kennedy; Capt. C. Kerr; Lt. (temp. Capt.) A. F. Laird; Capt. W. G. Lyall; Capt. A. McCausland; Capt. R. R. McClenahan; Lt.-Col. C. F. McGuffin; Lt.-Col. J. D. McQueen; Maj. G. S. Mothersill; Capt. H. R. Mustard; Lt.-Col. G. R. Philp; Maj. G. H. Wilson; Lt.-Col. C. F. Wylde.

New Zealand Medical Corps.—Lt.-Col. (temp. Col.) D. J. McGavin; Lt.-Col. J. Hardie-Neil; Maj. T. D. M. Stout; Capt. W. G. Borrie.

South African Medical Corps.—Maj. (actg. Lt.-Col.) R. N. Pringle; Temp. Maj. C. M. Murray.

Indian Medical Service.—Col. C. C. Manifold, C.B.; Lt.-Col. H. J. K. Bamfield.

Supplementary.—Capt. (temp. Lt.-Col.) D. B. Chiles-Evans, D.S.O., R.A.M.C. (killed); Capt. J. R. N. Warburton, R.A.M.C.

The following names of medical officers are mentioned in a despatch received from the Acting Sirdar and Governor-General of the Soudan, dated April 17th, 1917:—

Capt. S. McK. Saunders, R.A.M.C. (senior medical officer); Capt. B. H. H. Spence, R.A.M.C.

FOREIGN DECORATIONS.

Russian.

Order of St. Stanislas, 2nd Class (with Swords).—Fleet-Surgeons R. Hill, C.V.O. (now Deputy Surg.-Gen.), J. A. Moon, D.S.O., J. C. Ferguson, C. M. Beadnell, T. Austen, A. Maclean, D.S.O., H. W. Finlayson, D.S.O., E. C. Cridland, E. A. Penfold, D.S.O., L. Kilroy, H. K. Jones, and J. Stoddart.

Order of St. Stanislas, 3rd Class (with Swords).—Surgeon-Probationers A. G. Bee, G. Bluston, W. A. Turner, and W. E. Heath, R.N.V.R.

Order of St. Anne, 1st Class (with Swords).—Surg.-Gen. M. W. O'Keefe, C.B.

Order of St. Anne, 3rd Class (with Swords).—Staff-Surgeons F. H. Gowans, T. E. Blunt, and J. McA. Holmes, D.S.O.

French.

Légion d'Honneur, Croix de Chevalier.—Lt.-Col. A. E. Le Bel, Canadian, A.M.C.

Croix de Guerre.—Lt.-Col. H. B. Fawcus, C.M.G., R.A.M.C.; Temp. Capt. R. W. P. Jackson, R.A.M.C.; Capt. S. J. Linzell, R.A.M.C.; Col. S. Macdonald, C.M.G., A.M.S.; Temp. Capt. A. G. Maitland-Jones, R.A.M.C; Temp. Capt. V. M. Rich, R.A.M.C.; Temp. Capt. A. G. H. Smart, R.A.M.C.

THE WAR AND MEDICINE IN THE UNITED STATES.

Medical education in the United States during the war will proceed as far as possible on pre-war lines. As the result of a conference of the deans of the medical schools of the United States, held in Washington, it has been decided that it would be inexpedient to alter courses of instruction in order to expedite graduation. It is considered that the existing standards of medical education are better calculated to ensure a regular and adequate supply of competent physicians, however long the war may last, than any modification of prevailing methods. It has been agreed, however, to reorganise medical teaching so far as may be practicable in order to release as many men from the faculties of the medical schools as can be spared for military duty.

Under the title of the Red Cross Supply Service a new organisation has been formed to distribute among American soldiers and military hospitals gifts and supplies from patriotic individuals and relief societies throughout the country. The headquarters will be in Washington, with branches to supervise the collection and preparation of supplies at other large cities. It is hoped that much waste will be eliminated through coöperation with relief societies and systematic methods of purchase and distribution.

In the States there have been conferences of State and Territorial health officers to discuss the war work of the health authorities. In connexion with the sanitation of military and naval camp sites and the hygienic control of camps, it is suggested that the police power of the various jurisdictions might be brought to bear directly on the environments of camps, and so establish a subsidiary control in addition to that of the military authorities, while State laboratories might be made available for the diagnosis and sanitary oversight of infectious diseases among troops. Special precautions will be taken to prevent the introduction of infectious diseases owing to contact between the civilian and military populations.

The pharmaceutical manufacturers are going energetically into the business of supplying the medicines required for the war. Mr. Frank G. Ryan, president of Messrs. Parke, Davis, and Co., has enlisted in the Army and has been detailed on the Council of Defence, a body organised for the purpose of mobilising the industries of the country. This body has comprehensive powers and has already gone to work in a systematic manner. Mr. Ryan is secretary of the committee having the pharmaceutical and chemical section of the work specially in charge. The organisation covers every manufacturer of importance in the country, and each firm has promised to do its full duty. It is estimated that the supplies for hospital service alone will require 40,000 freight cars for transit, and the usual proportion of this material will consist of drugs and chemicals. This will interfere with the regular trade to a considerable extent, manufacturers having unanimously decided that the needs of the army must come first.

HEALTH OF THE MESOPOTAMIAN ARMY.—The War Office has issued a statement to the effect that the incidence of sickness among the men occupied in the Mesopotamian campaign is 60 per cent. less for the first fortnight of May, 1917, than for the corresponding period last year.

OBITUARY OF THE WAR.

ARTHUR TILBURY, M.R.C.S. ENG.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain A. Tilbury, who is reported missing, believed drowned on May 4th, when the *Transylvania* was sunk, was youngest son of John Tilbury, of Oakley, Hants, and brother of Mr. R. Tilbury, M.R.C.S., of 235, Queen's-road, S.E., with whom he was in partnership. Educated at Guy's Hospital, he obtained the qualification of the Conjoint Board (Lond.) in January, 1913, and joined his brother, while he continued to do clinical appointments at Guy's Hospital. When war broke out he was called up as a reservist in the London University O.T.C., and received a commission in the R.A.M.C. After serving at Canterbury for a year he was sent to Egypt in September, 1915. In March, 1917, he came to England on special duty, and it was on his return journey that he met his early death. His loss is keenly felt by his many friends at Guy's Hospital.



LEONARD GEORGE SCUDAMORE, M.R.C.S. ENG., L.R.C.P. LOND.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant L. G. Scudamore, who recently died in camp in England after a few hours' illness at the age of 47 years, was the seventh son of the late Frank Ives Scudamore, C.B. Born in Eltham he spent his early years in Turkey, where his father was stationed. He received his general education in France and Germany, returning to England to study medicine at St. Thomas's Hospital, whence he took the Conjoint diploma in 1891. For the past 15 years he had practised as a colliery surgeon in South Wales and Monmouthshire and was thus engaged when he took up war work. He served first as a civil surgeon at Edmonton Military Hospital, applying later for a commission, which was granted him in June, 1916. He served at various camps in this country, and to his keenness and unsparing devotion to duty his sudden and untimely death is attributed by those who knew him.



At the Edmonton Military Hospital Lieutenant Scudamore proved himself a capable surgeon and agreeable colleague. One who worked with him there writes: "Those of us who were fortunate enough to get behind the barrier of his reserve were able to appreciate the noble heart of the man, the astonishing wideness of his knowledge, his linguistic gifts and caustic humour, and lastly, his great devotion to duty. His self-denying work did not escape the notice of his patients, and it is no exaggeration to say that he was worshipped by the colliery villagers and soldiers among whom he worked."

Lieutenant Scudamore had only recently married Sister Gertrude Able, R.R.C., formerly of the Royal Orthopædic Hospital and now of the Prince of Wales's Hospital for Officers, with whom the greatest sympathy is felt.

JOHN JAMES WEAVER, M.R.C.S. ENG.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain J. J. Weaver, who was recently thrown from his horse at the Curragh Camp and killed, was 54 years of age and son of the late Dr. John Weaver, of Southport. Educated at University College, London, he qualified in 1886, and after a resident appointment at Oldham Infirmary went a cruise in a private yacht in the Mediterranean, when he rendered assistance to the crew and passengers of the wrecked P. and O. *Tasmania* in circumstances of great credit. Two years as house surgeon to the Southport Infirmary followed, and he then settled in practice at Southport. Becoming more and more interested in public work he was appointed to the medical officership of health in 1900. He became chairman of the health committee and an active agent in securing improvements in the sewerage system of the town and in the water- and milk-supplies. He already held commissioned rank as a surgeon with the Territorials, and in April, 1915, accepted a commission in the R.A.M.C., attached to the East Lancs Regiment, with which he served in various parts of England. Quite recently he was appointed chief sanitary officer at the Curragh, where he was killed instantaneously by a fall from his horse.



Outside his public work Captain Weaver was interested in various benevolent institutions in Southport. He was at one time honorary medical officer to the Day Nursery in Boundary-street and to the Girls' Orphanage and Training Home. He was generally known as a good friend to the poor in the town. Captain Weaver was married to Annie Pennington, daughter of the late T. O. Clinning, J.P., of Birkdale, by whom and a daughter he is survived.

JOHN BAILEY TACKABERRY, M.B., B.S. LOND.,

CAPTAIN, INDIAN MEDICAL SERVICE.

Captain J. B. Tackaberry, who died of cerebro-spinal fever in Mesopotamia on March 25th, was second son of the late T. Tackaberry, of Dungannon. Educated at Dungannon Royal School and Trinity College, Dublin, he received his medical training at the Middlesex Hospital, where he qualified M.B., B.S. Lond. in 1909. He held resident posts in the hospital and was assistant demonstrator of anatomy in the medical school before entering the Indian Medical Service, with a high place in the examination in 1911. After serving in India and at Hong-Kong, and receiving promotion in 1913, he was sent out to Mesopotamia attached to a Punjabi regiment. He leaves a widow, who is engaged in voluntary nursing at St. John's Hospital, Sevenoaks, and one child.



THE MIDDLESEX HOSPITAL AS A "MOBILISATION CENTRE."

The War Office have decided to make an immediate but strictly limited trial of the scheme for organising hospital units contained in the pamphlet by Lieutenant-Colonel Sir James K. Fowler, K.C.V.O., on the "Medical and Nursing Services of the Imperial Army," which we noticed last week.[1] Circumstances having necessitated an increase in the hospital accommodation for the armies in the various theatres of war, it has been determined that one of the additional units required may be raised from amongst the medical men educated at a single London hospital who have not yet been able to serve abroad for various reasons, or, having already done so, desire to renew their engagements for a further period. The Middlesex Hospital has been selected for the trial, and Sir James Fowler has undertaken to form a "mobilisation centre" as described in his pamphlet.

This is not to be regarded as in any sense affording a test of the value of the scheme as a whole, which is one obviously intended to come into operation at the outbreak of a war. More than 400 Middlesex men are known to be now, or to have been some time during the war, serving as officers of the Royal Army Medical Corps, and other hospitals have an equally good record. The officers of this new unit will all be Middlesex men, the matron, sisters, and nurses will have been trained at that hospital, and the V.A.D.'s will be selected from families connected with the hospital, but the orderlies will be men now serving with the Royal Army Medical Corps. The unit will be known as the Middlesex No. —— General Hospital. No undertaking will be given that the personnel of this unit be not detached to other units, as the exigencies of the service may render such a proceeding necessary. The unit will be raised for general service and will be sent to any of the various theatres of war at which it may be required. It follows that the officers, nurses, &c., must all be fit for general service, and engagements will be for the duration of the war. No applications from Middlesex men now serving abroad for transfer to this unit will be considered except in special circumstances.

Communications connected with the unit should, in the first instance, be addressed to Lieutenant-Colonel Sir James Fowler, or, in the case of nurses and V.A.D.'s, to the Matron, at the Middlesex Hospital, Mortimer-street, W.

NEW MILITARY HOSPITALS.—The first Plymouth V.A.D. hospital was formally opened by the Mayor in the presence of a large gathering. The hospital contains 200 beds arranged in 16 marquees. The County Territorial Association have placed their buildings at the disposal of the authorities, and these are used for dining- and recreation-rooms and offices. The sum of £3206 has been collected locally towards the cost of the scheme.—Tockington Manor, Gloucestershire, has been fitted up as a military hospital through the generosity of Captain Salmon. It is to be used by the authorities of the Beaufort War Hospital, and was formally opened last week and 20 patients admitted.—On May 16th Miss G. Buller formally opened the new building which is to be an extension of the Crediton (Devon) V.A.D. Hospital. It will provide accommodation for 42 beds, and increase the accommodation in the Crediton Hospital to a total of 72 beds. Mr. Leslie Powne is in medical charge of the institution.—Ashton Court, near Bristol, has been recently opened as a convalescent home for officers, and 70 patients are in residence.—Bathampton House, near Bath, which has been fitted up as a Red Cross hospital, has now been opened. It is delightfully situated and is the second Red Cross hospital in Bath.

PERSONS engaged in the manufacture, purchase, sale, or other dealings in artificial human eyes have been ordered, under the Defence of the Realm Regulations, to send in to the Director of Optical Munitions and Glassware Supply, 117, Piccadilly, W. 1, immediate returns containing particulars of the number, type, and material of all artificial human eyes in their possession or under their control.

[1] The pamphlet, price 3*d*, may be obtained from Messrs. Macmillan and Co., Limited, St. Martin's-street, London.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Gen. Sir Arthur W. May, K.C.B., K.H.P., has been placed on the retired list from June 1st, 1917, at his own request.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. H. E. M. Douglas, V.C., C.M.G., D.S.O., to be temporary Colonel whilst employed as Assistant Director of Medical Services of a Division.

Temp. Major D. P. Kappele (Can. A.M.C.) to be temporary Lieutenant-Colonel while holding appointment as O.C. Can. Cav. Field Ambulance.

Temp. Major W. Hind (Major and Bt. Lieut.-Col., T.F. Res.) to be temporary Lieutenant-Colonel.

Temp. Capt. Ryder P. Nash (Capt., R.A.M.C., T.F.) to be acting Lieutenant-Colonel whilst in command of a Field Ambulance.

Lieut.-Col. A. R. Aldridge, C.S.I., C.M.G., Res. of Off., to be acting Colonel whilst specially employed.

Temp. Major W. R. Dawson to be temporary honorary Lieutenant-Colonel.

Temp. Hon. Major W. I. de C. Wheeler to be temporary Major and honorary Lieutenant-Colonel.

Temporary Captains to be temporary Majors: H. H. Serpell, E. W. Witham, V. J. Blake, F. B. G. Stableford, G. P. Humphery, B. G. Elliott (Major E. Lan. R. (T.F.)), C. Saint-Pierre (Can. A.M. Corps), L. E. Pariseau (Can. A.M. Corps), J. A. H. Forgues (Can. A.M. Corps), J. L. Petitclerc (Can. A.M. Corps), J. Lafleur (Can. A.M. Corps).

W. S. Haughton to be temporary Major.

Capt. O. R. McEwen to be acting Major whilst in charge of a Base Depôt Medical Store.

The undermentioned are granted temporary rank for duty with South African Native Labour Corps: As Majors: T. N. Frood, F. H. Welsh. As Captain: C. A. Kitching, E. B. Israel, W. F. McGlashan, H. Tren, W. J. Calder, W. L. A. Leslie, C. D. Goodenough, G. B. Moffat, L. E. Hertslet, L. P. Booth, T. A. Beddy, M. Ricono, C. J. H. Aitken, J. McLaw, C. G. Todd.

The undermentioned are granted temporary rank whilst serving with Belfast War Hospital: As Lieutenant-Colonel: W. Graham. As Captain: S. J. Graham.

A. C. D. Firth, late temporary Captain, is granted the honorary rank of Captain.

Temporary Lieutenants to be temporary Captains: J. R. Payne, D. MacC. Brown, A. N. Drury, A. A. B. Scott, J. C. Anderson, H. I. Davies, F. W. Davidson, C. Stanley-Clarke, J. A. Vlasto, C. G. Kemp, F. C. Jobson, C. C. Austin, J. Gray, R. L. Ferguson, O. R. Allison, T. M. Bride, A. E. Finney, P. S. Green, W. A. Cardwell, W. W. Wood, F. Shannon, L. Gameson, S. H. Calnek, E. H. Montgomery, H. M. Drake, G. Arthur, D. I. Dakeyne, C. A. R. McCay, E. J. B. Moynihan, H. H. Crickitt, R. H. Balfour-Barrow, G. W. Doran, W. T. Evans, D. M. Smith, J. Manuel, H. Joslen, W. Spiteri, J. A. H. Vanderwert, A. P. MacMahon, W. M. Stewart, R. Lindsay, J. W. Macfarlane, F. R. Martin, J. N. Cruikshank, A. Davidson, J. B. Fisher, T. R. Fulton, G. Kirkhope, T. H. V. King, P. G. Foulkes, S. G. Harrison, V. C. James, J. A. Tobin, R. G. Gillies, A. A. Greenwood, W. B. Knobel, W. D. Newcombe, L. G. Jacob, A. N. Haworth, D. Kennedy, W. C. Gore, P. A. Dargan, D. W. Smith, E. H. Eastwood, N. B. Capon.

A. Stephens, late temporary Lieutenant, to be Honorary Lieutenant.

E. Kaye Le Fleming to be temporary Honorary Lieutenant whilst employed with the British Red Cross Hospital, Netley.

Temp. Hon. Lieut.-Col. C. H. Fagge (Major, R.A.M.C., T.F.), having resigned his appointment, relinquishes his temporary commission.

Officers resigning their commissions: Temp. Maj. S. W. Woollett, and is granted the honorary rank of Major. Temporary Captains: M. E. Robinson, A. T. Roberts, C. J. Butler, J. A. Gibb, C. S. Crichton, T. L. Wormald, A. H. Butcher, G. W. Stone, H. C. Thorp, J. R. McVail. Temporary Lieutenants: L. F. McDowell, W. T. Little, H. R. Hodgkinson, M. D. Baker, W. Anderson, F. H. Simpson, W. H. C. Romanis, G. A. Francis, C. D. Hatrick, R. H. Titcombe, T. F. Collins, H. Lewis, D. J. Roantree, A. E. A. Carver, A. Smirthwaite, R. E. J. St. J. Griffin.

SPECIAL RESERVE OF OFFICERS.

Capt. R. Magill to be acting Lieutenant-Colonel whilst in command of a Field Ambulance.

Lieut. on probation J. A. W. Cullen is confirmed in his rank.

To be Lieutenants: A. B. Black, W. Brown, N. S. Bruce, S. N. Dyke, R. G. Battersby, L. W. Hughes, and J. J. Mulvey, from the Glasgow University Contingent, O.T.C.; F. O. Taylor, J. H. Wiseman, R. L. Robinson, and O. St. L. Campion, from University of London Contingent, O.T.C.; W. W. Newton, J. J. A. Scott, H. G. V. Mence, and F. J. Harvey, from Birmingham University Contingent, O.T.C.; T. C. Murphy, J. Rowland, H. Chadwick, H. Gainsborough, and L. Gill.

TERRITORIAL FORCE.

Major (acting Lieut.-Colonel) W. D. Watson relinquishes his acting rank on ceasing to command a field ambulance.

Lieut.-Col. C. E. Douglas, from T.F. Reserve, to be Lieutenant-Colonel.

Major W. McCall to be Acting Lieutenant-Colonel while commanding a field ambulance.

Capt. R. P. Nash is seconded whilst holding a temporary commission in the R.A.M.C.

Capt. A. G. R. Foulerton to be temporary Major.

Capt. (temp. Major) A. C. H. McCullagh to be Acting Lieutenant-Colonel while commanding a field ambulance.

Capts. S. Acheson and J. W. Heslop, from T.F. Reserve, to be Captains.

Lieuts. C. A. E. I. Brownlee and J. McG. H. Reid to be Captains.

To be Lieutenants: L. H. Callendar, F. J. E. China, and R. C. Davie.

Capt. E. P. I. Coke relinquishes his commission on account of ill-health, and is granted the honorary rank of Captain.

Capt. R. J. Irving relinquishes his commission on account of ill-health.

TERRITORIAL FORCE RESERVE.

Col. A. V. Clarke to be Colonel.

INDIAN MEDICAL SERVICE.

The relinquishment of the temporary rank of Lieutenant by Narayan Mahadev Bodas and Tanguturi Janakiramiah has been approved by the King.

COLONIAL MEDICAL SERVICES.

West African Medical Staff.—The death is reported of Mr. L. Doudney, medical officer, Nigeria (Northern Provinces), and of Dr. T. Ryan, medical officer, Gambia, who was drowned at sea by enemy action. Mr. C. E. S. Watson, Senior Medical Officer, has been promoted Provincial Medical Officer, Nigeria (Northern Provinces). Dr. J. C. M. Bailey, Temporary Lieutenant, R.A.M.C., has been appointed Senior Medical Officer, Nigeria (Southern Provinces). Dr. A. E. Horn, Senior Medical Officer, has been transferred from the Gambia to Nigeria (Northern Provinces), and Mr. E. C. Adams, Senior Medical Officer, from the Gold Coast to the Gambia. Dr. R. W. Gray, Senior Medical Officer, Nigeria (Southern Provinces), has retired on pension, and Dr. G. G. P. Beckett, Temporary Lieutenant, R.A.M.C., medical officer, Gold Coast, has resigned his appointment. Dr. G. F. Darker has ceased to be temporarily re-employed as Medical Officer, Nigeria (Northern Provinces), and Dr. H. G. F. Spurrell has ceased to be temporarily employed.

The following officers, whose services have been placed at the disposal of the Army Council, have been given temporary commissions in the Royal Army Medical Corps: A. C. Parsons, C. L. Ievers (Gold Coast), E. A. Charters, and W. G. Cobb (Nigeria). The following have been temporarily lent to other administrations: A. E. Horn, T. H. Suffern (Nigeria), G. J. Keigwin (Gold Coast) to the Provisional Civil Administration, German East Africa; H. F. Hamilton (Gold Coast), P. A. Clearkin, J. McK. Clark, J. M. O'Connell (Sierra Leone) to the East Africa Protectorate; J. Currie (Nigeria) to the Uganda Protectorate; and H. E. Arbuckle (Sierra Leone), and E. J. Quirk (Nigeria) to the Nyasaland Protectorate. T. M. R. Leonard, G. H. Gallagher, T. E. Sandeman, E. Gibson, and C. Mackey (Nigeria) are on military duty in East Africa.

DEATHS IN THE SERVICES.

Brigade-Surgeon Augustus Frederick Elliot, A.M.S. (retired), at his residence, Exmouth, on May 25th, in his eighty-fourth year. He joined the Army Medical Service in 1861, served in the Ashanti War of 1873 and 1874, and was present at the capture of Coomassie. He retired in 1884 with the honorary rank of brigade-surgeon.

Medical News.

UNIVERSITY OF LONDON.—At examinations held recently the following candidates were successful:—

THIRD (M.B., B.S.) EXAMINATION FOR MEDICAL DEGREES.

Charles Vincent Boland, St. Bartholomew's Hospital; Clement Capton Chesterman, University of Bristol; Hetty Ethelberta Claremont, London School of Medicine for Women and St. George's Hospital; Raghunath Ganesh Dani, University College Hospital; Philip Oswald Ellison, St. Bartholomew's Hospital; Thomas Stenner Evans, University College, Cardiff, and St. Mary's Hospital; John William Heekes, Charing Cross Hospital; Jerusha Jacob Jhirad, London School of Medicine for Women; John Isaie Keen (honours, distinction in surgery), Charing Cross Hospital; Frank Alexander Knott, Guy's Hospital; Edward Eric Lightwood, Westminster Hospital; John Edward George McGibbon, University of Liverpool; George Alex Sheridan Madgwick, London Hospital; Ferdinand Molina, St. Thomas's Hospital; Victor J. E. C. del S. Perez y Marzan, University College Hospital; Pinthu Sai, St. Thomas's Hospital; Basil Sampson, Guy's Hospital; Raghunath Dadoba Shirvalkar, University College Hospital; Philip Smith, Guy's Hospital; Daniel Jenkin Thomas and John Herbert Thomas (honours, distinction in surgery), University College Hospital; and Lotty Welhermann, London School of Medicine for Women.

B.S. EXAMINATION *(for Students who graduated in Medicine in or before May, 1904).*

Sidney Forsdike, University College Hospital.

The following candidates have passed in one of the two groups of subjects:—

Group I.—Hannah Katherine Alton, King's College Hospital and London School of Medicine for Women; Elizabeth Labrey Ashby, University of Birmingham; Margaret Stote Glen Bott, Dorothy Trevor Daintree, Alice Mary Ley Greaves, and Rosalie Jobson, London School of Medicine for Women; William Arthur Edward Karunaratne, University College Hospital; Sinnethamby Muttiah, London Hospital; Morris Schwartz, University College Hospital; and Ellen Sylk, London School of Medicine for Women.

Group II.—Thomas Anwyl Davies, St. Thomas's Hospital; Susan Alfreda Finch, London School of Medicine for Women; Harry Mainwaring Holt, University of Leeds; and Henry Cecil Jennings and Cyril Valentine Pink, St. Thomas's Hospital.

HILDEN CONVALESCENT HOSPITAL, BELFAST.—This institution, the first hospital established in Ulster under the joint auspices of the British Red Cross Society and the Order of St. John, was organised by the Joint Ulster Committee of these two societies, and was opened on May 23rd by Mrs. Harold Barbour, whose generous contribution to the funds made the inception of the hospital possible. Admirably situated in a well-wooded park in the southern outskirts of Belfast, the main hospital, a private mansion, has accommodation for 50 wounded soldiers, with an annexe containing 80 beds. Sir Robert Kennedy, K.C.M.G., D.L., chairman of the Ulster Joint Committee of the Red Cross and St. John, who presided, was supported by the Lord Mayor of Belfast, the High Sheriff of Belfast, and General Sir William Adair, K.C.B., D.L. Sir John Byers said there were two valid reasons for the foundation of such a beautiful hospital—first, it occupied a niche of its own amongst all the other hospitals in the city of Belfast that had to do with wounded soldiers, inasmuch as it was concerned mainly with convalescents, while its existence would help the Minister of Pensions in his scheme for the up-building of the wounded soldier.

A DEVONSHIRE CENTENARIAN.—Mrs. Mary Honeywill died recently at Marybank, Beeson, in her 101st year.

Lieut.-Colonel (Temp. Colonel) Oliver Long Robinson, C.M.G., R.A.M.C., has been appointed an honorary physician to the King, vice the late Surgeon-General Sir W. Taylor, K.C.B., M.D.

Lord Rhondda is announced to address a meeting at the Queen's Hall, London, on Wednesday next, at 5 P.M., on the progress made during the past six months in the campaign against venereal disease. Sir Alfred Keogh will speak to the military side of the question. The Lord Mayor of Liverpool and Mrs. Creighton will also speak, the latter representing the women's point of view. Application for tickets should be made to the secretary of the National Council for Combating Venereal Diseases, Avenue Chambers, Southampton-row, W.C.1.

PLYMOUTH ASYLUM.—The Plymouth borough council has adopted a scheme for the enlargement of the borough asylum. It provides accommodation for 440 additional patients, at an estimated cost of £100,000. The Board of Control has just informed the local authorities that it is prepared to consider the plans for this extension.

MEDICAL TREATMENT OF THE DISCHARGED AND DISABLED.—The Executive Committee of the National Medical Union, at a meeting held on May 29th, resolved that the following expression of opinion be sent to Mr. Barnes, the Pensions Minister: "That if it be, as reported, the intention of the Government to limit the choice of medical attendance for discharged disabled uninsured soldiers and sailors to medical men on the Insurance panels, it is a gross invasion of their right to freedom of choice, and an injustice to the large body of medical men not engaged in Insurance practice."

THE LATE MR. W. WHITWORTH.—William Whitworth, M.R.C.S., L.S.A., died at his residence, St. Agnes, Cornwall, on May 14th, in his sixty-fourth year. The deceased, who succeeded to his late father's practice, had practised in St. Agnes for 30 years, and was district medical officer and honorary medical officer to the convalescent home. He did much good work for the establishment of the local nursing association, and the Miners' and Mechanics' Institute owes its present building largely to his efforts. His portrait was presented to him by the local residents in 1903. He leaves a widow and three sons, two of whom are in the Army.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

DUNSTAN, ROBERT, M.R.C.S., L.S.A., has been appointed Acting Medical Officer and Public Vaccinator for the Paignton and Marldon District of the Totnes (Devon) Union.

HEATH, CHARLES, J., F.R.C.S. Eng., Consulting Aurist to the Metropolitan Asylums Board Infirmary for Children.

LOCKET, THOMAS WOOD, M.A., M.B., B.C. Camb., Acting Medical Officer and Public Vaccinator for the Lacock District of the Chippenham (Wilts) Union.

MASON, P. J., M.B., Ch.B. Birm., Certifying Surgeon under the Factory and Workshop Acts for the Tipton District of the county of Stafford.

SALT, ARTHUR PHILIP, M.R.C.S., L.R.C.P., Medical Officer to Totnes Workhouse, and Medical Officer and Public Vaccinator, Totnes and Harberton Districts of the Totnes (Devon) Union.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BIRMINGHAM CITY EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £300 per annum.

BODMIN, CORNWALL COUNTY ASYLUM.—Female Junior Assistant Medical Officer. Salary £200 per annum, with board, &c.

BOOTLE BOROUGH HOSPITAL.—Junior House Surgeon. Salary £170 per annum, with board, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Physician. Salary £150 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

CAPE TOWN, SOUTH AFRICAN COLLEGE.—Professors of Pharmacology, Pathology, and Bacteriology. Salary at rate of £800 per annum each.

CHARING CROSS HOSPITAL, Agar-street, W.C.—House Physician and House Surgeon. Salaries £100 per annum, with board, &c.

COVENTRY AND WARWICKSHIRE HOSPITAL.—House Surgeon (second Resident). Salary £300 per annum, with board, &c. Also House Physician. Salary £250 per annum, with board, &c.

DARLINGTON GENERAL HOSPITAL.—House Surgeon. Salary £200 per annum, with board, &c.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

DUMFRIES AND GALLOWAY ROYAL INFIRMARY.—House Surgeon.

GRIMSBY AND DISTRICT HOSPITAL.—House Surgeon. Salary £5 5s. per week, with board, &c.

GUY'S HOSPITAL.—Assistant in Bacteriological Department. Salary at rate of £250 per annum.

HAWKHEAD ASYLUM, Cardonald, Glasgow.—Senior Assistant Medical Officer. Salary £350, with board, &c. Also Junior or Temporary Assistant.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Resident Medical Officer. Salary £200 per annum, with board, &c.

LIVERPOOL EYE AND EAR INFIRMARY, Myrtle-street.—Female House Surgeon. Salary £150 per annum, with board, &c.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, near Manchester.—Two Female Resident Medical Officers, unmarried. Salary at rate of £100 per annum.

MANCHESTER, CORPORATION OF.—Temporary Assistant Tuberculosis Officer. Salary £450 per annum.

MANCHESTER, HULME DISPENSARY, Dale-street, Stretford-road.—House Surgeon. Salary £250 per annum, with apartments, &c.

MANCHESTER ROYAL EYE HOSPITAL.—House Surgeon. Salary £120 per annum, with board, &c.

MANCHESTER ROYAL INFIRMARY AND DISPENSARY.—Honorary Assistant Physician.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL.—House Physician. Salary £200 per annum, with board, &c.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N.—Honorary Assistant Surgeon to Ear, Nose, and Throat Department.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician, Casualty House Surgeon, and House Surgeon for six months. Salary £100 per annum, with board, &c. Also Temporary Assistant Physician Wednesday afternoons to see Out-patients. Lunch provided and Travelling Expenses.

ROTHERHAM HOSPITAL.—Junior House Surgeon. Salary £150 per annum, with board, &c.

SHEFFIELD, JESSOP HOSPITAL FOR WOMEN, GYNÆCOLOGICAL AND MATERNITY DEPARTMENTS.—Junior Female House Surgeon, unmarried. Salary £200 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SHREWSBURY, ROYAL SALOP INFIRMARY.—House Physician. Salary at rate of £200 per annum, with board, &c.

STOCKPORT, COUNTY BOROUGH EDUCATION COMMITTEE.—School Medical Officer. Salary £300 per annum.

TAUNTON AND SOMERSET HOSPITAL.—Senior House Surgeon. Salary £250 per annum, with board, &c.

WESTMORLAND CONSUMPTION SANATORIUM AND HOME, Meathop, Grange-over-Sands.—Assistant Medical Officer. Salary £300 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at East Wemyss, in the county of Fife.

Births, Marriages, and Deaths.

BIRTHS.

FISHER.—On May 31st, at Belgrave-crescent, Edinburgh, the wife of Edward F. Fisher, M.B., F.R.C.S., Temporary Surgeon, R.N., of a daughter.

HAYES.—On May 30th, at Fallowfield, Edgbaston, the wife of Captain L. C. Hayes, R.A.M.C., of a son.

TIRARD.—On June 5th, Mabel (*née* Dury), wife of Lieutenant N. S. Tirard, R.A.M.C., of a daughter.

MARRIAGES.

ALDERSON—PASTEUR.—On June 4th, at St. Andrew's, Wells-street, by the Rev. W. Harry Roberts, M.A., Captain Gerald Graham Alderson, F.R.C.S., R.A.M.C., son of Mr. and Mrs. John Alderson, of Newcastle-on-Tyne, to Marguerite Norah, elder daughter of Colonel W. Pasteur, A.M.S., and Mrs. Pasteur, Chandos-street, Cavendish-square.

WARBURTON—O'HAGAN.—On June 2nd, at St. John's Church, Pendlebury, by the Rev. T. Dale Jones, M.A., Gilbert Bertram Warburton, M.B., Ch.M., F.R.C.S. Eng., second son of the late Samuel Warburton, of Bolton, to Edith Eveline Maureen, younger daughter of Charles O'Hagan, of co. Meath, Ireland.

DEATHS.

BARTLET.—On May 27th, at Birkfield, Ipswich, J. H. Bartlet, M.D., aged 87.

HILL.—On June 2nd, at The Brow, Clevedon, Somerset, Walter J. Hill, M.R.C.S., L.R.C.P.

IRVINE.—On May 22nd, at Abergeldie, Torquay, J. Pearson Irvine, C.E., O.R., only and beloved son of the late J. Pearson Irvine, M.D., F.R.C.P. Lond., Mansfield-street, Cavendish-square, London, W., and Mrs. Irvine (late of Cromartie), Torquay.

VAUGHAN.—Killed in action on May 22nd, R. W. Vaughan, M.B., M.R.C.S., L.R.C.P. Lond.

WINKFIELD.—On June 3rd, at Beaumont-street, Oxford, Alfred Winkfield, M.A., F.R.C.S., aged 79 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

"BANTING."

IT is interesting at the present time, when certain foods are practically excluded from our diet, to turn to William Banting's "Letter on Corpulence, addressed to the Public" (2nd edit., 1863). Mr. Banting, an undertaker by trade, *not* a physician as stated in an American medical dictionary, had found himself growing excessively fat and had sought advice in all directions without finding it. An article in the *Cornhill Magazine* on "What is the Cause of Obesity?" offered no tangible remedy for corpulence, and Banting went the rounds of the consultants without discovering anyone who could relieve him of his too, too solid flesh, till one day, seeking a remedy for increasing deafness, he lighted on an F.R.C.S., "an eminent aural surgeon," whose name he suppresses in the first two editions of his famous pamphlet, and was told to avoid starchy and saccharine matter. He felt better for the new regimen from the first and very soon was the much-talked-of "cure" of the hour. At his house in St. James's-street he was visited by obese persons of fashion, and to them, as well as to the suffering and presumably overfed public, he communicated his dietary. This is remarkable in view of our present shortage of the foods which he avoids—namely, bread, butter, milk, sugar, beer, and potatoes; it forms a vivid picture of the alcoholic and still almost Lucullan fare which was held to constitute short commons just 54 years ago.

"For breakfast," says Mr. Banting, describing his daily menu during his treatment, "I take four or five ounces of beef, mutton, kidneys, broiled fish, bacon, or cold meat of any kind except pork; a large cup of tea (without milk or sugar), a little biscuit, or one ounce of dry toast. For dinner, five or six ounces of any fish except salmon, any meat except pork, any vegetable except potato, one ounce of dry toast, fruit out of a pudding, any kind of poultry or game, and two or three glasses of good claret, sherry, or Madeira—champagne, port, and beer forbidden. For tea, two or three ounces of fruit, a rusk or two, and a cup of tea without milk or sugar. For supper, three or four ounces of meat or fish, similar to dinner, with a glass or two of claret. For nightcap, if required, a tumbler of grog—(gin, whisky, or brandy, without sugar)—or a glass or two of claret or sherry. This plan leads to an excellent night's rest, with from six to eight hours' sound sleep. The dry toast or rusk may have a tablespoonful of spirit to soften it, which will prove acceptable."

Grand total about 21 ounces of solids and 30 of liquids, *plus* the grog or the "glass or two," but no quantity need be rigidly adhered to provided the forbidden foods be eschewed.

CRÊPE BANDAGES.

Alfred Velpeau, a Paris surgeon of the middle of the nineteenth century whose name is associated with the introduction of the crêpe bandage, may well be regarded as a benefactor by those who were formerly dependent for elastic pressure on bandages containing caoutchouc. The crêpe bandage, while of constant width, is highly elastic in its length, and is light, cleanly, and well ventilated. Formerly manufactured exclusively in Geneva, crêpe bandages may now be obtained in this country. The Norwich Crape Company (1856), Limited, has sent us samples of bandages and of various qualities of bandage material, all of good make. These bandages may be used with added comfort to the patient to replace the ordinary inelastic bandage under all kinds of conditions. The initial expense is largely compensated by the length of time which the crêpe bandage lasts when carefully used.

TREE "SURGERY."

THERE has recently appeared in the public press an interesting account by Mr. Henry Wood, special correspondent of the United Press of America with the French armies, of the efforts made to restore trees mutilated by Germans in their retreat. There were thousands of trees, he reports, that the close pursuit of the French prevented the Germans from completely cutting down; instead, the tree-killers cut off a circle of bark around the trunk, which with a few days' exposure to the sun would be sufficient to kill peach, plum, apple, apricot, and cherry trees that had been half a century attaining their productiveness. These trees, of course, presented an easy problem to those skilled in arboriculture, and such experts were quickly summoned into counsel on the regained French territory. The wounds were bound up like the wounds of a soldier, and thousands of Army surgeons and Red Cross ambulance drivers and stretcher-bearers assisted in the work. The circle where the bark had been cut away was first covered with a grafting cement and the entire wound bandaged—often with bandages that had been prepared for human limbs. So great was the number of trees that had to be dressed in this way that the entire available supply of grafting preparation was quickly exhausted.

Where the trees had been entirely cut or sawn down the protruding stumps were trimmed, and the exudation of the sap was prevented by clay or cement dressings, while branches from the upper portion of the trees which showed signs of life activity were grafted on many of the severed stumps. To-day, Mr. Wood tells us, these grafts are in full leaf and blossom. The roots appear to have been entirely saved by this process, and years have been saved in restoring the cut-down orchards of France. "Tree surgery" is no new art, and for several years, particularly in America, the practice of preserving trees that have been injured by disease or accident has been successfully carried out by filling stumps with cement. The protection of severed vegetable tissues with wax, tar, and other substances has been long used in horticulture and arboriculture. The principles governing the "surgery" of plants are, in many respects, similar to those which appertain to human surgery.

LONDON CHILDREN'S COUNTRY HOLIDAYS.

THOSE responsible for the Children's Country Holiday Fund are proposing to adopt the same policy this year as last—viz., to select a moderate number of specially ailing children and send them away for the usual fortnight. Railway companies are still willing to charge the half single fare for the children, but the increasing difficulty of finding country homes under existing food conditions and the dearth of available London visitors is likely considerably to reduce the numbers who can safely be sent away. The inspection before leaving London, both in regard to vermin and to possible infection, is so carefully conducted that medical attention is not very frequently required in the country. Under these conditions no hesitation need be felt in assisting this most beneficent work, which is in line with the widespread effort not to let the child-life of the country suffer from the effects of the war if the contingency can in any way be avoided.

THE MEDICAL HISTORY OF THE UNITED STATES.

Now that American doctors, surgeons, and nurses are arriving in Great Britain and France there will naturally be increased interest in all that concerns them and their history. Much information will be found in the voluminous American Medical Directory published by the American Medical Association at Chicago (fifth edition, 1916, $10). Another useful book is "The Cyclopædia of American Medical Biography," containing the lives of eminent deceased physicians and surgeons from 1610 to 1910. This book was compiled by Dr. Howard A. Kelly and published in two volumes by Messrs. W. B. Saunders Company, London and Philadelphia, in 1912. Other useful particulars are contained in "Who's Who in America," published in London by Kegan Paul, Trench, Trübner, and Co., Limited, and in Chicago by A. N. Marquis and Co. Useful information regarding the Colleges and Universities will be found in the reports of the Commissioner of Education issued by the Department of the Interior and published by the Government Printing Office, Washington, and in the Official Directory of Professional Education in the United States, published by the University of the State of New York. A good source of information is "The World Almanac and Encyclopedia," issued by the Press Publishing Company, Pulitzer Building, New York, of which copies can be obtained in London.

A USEFUL POCKET MEDICINE-CASE.

Messrs. Burroughs Wellcome and Co. have put up in handy form a collection of useful drugs and first-aid appliances enclosed in a case, 6 × 3½ × 1 in., which can readily be carried in the pocket. The drugs include quinine, acetylsalicylic acid, cascara, bismuth salicylate, ginger essence, and soda-mint. The first-aid outfit contains adhesive and court plaster, pleated bandage and gauze, jaconet, eye-brush and safety-pins, a capsule of iodine tincture, and soloids of potassium permanganate. The whole forms a useful pocket vade-mecum for any doctor, dresser, or nurse at home or abroad. The case is called No. 131 "Tabloid" Medicine Pocket-case, and costs from 13*s.* 6*d.* to 15*s.*, according to the material of the case.

T. O.—There is no generally accepted method of classifying cases of pulmonary tuberculosis, but a study of recent reports of tuberculosis officers shows a large proportion who use the Turban-Gerhardt classification, generally with some little modification of their own. Few, if any, have followed the suggestion of giving a separate estimate of extent of disease in the two lungs. Clinicians generally find the need of adding to a classification based upon physical signs some indication of symptoms. Turban always supplemented his original Groups I., II., and III. with the letters F, f, a to indicate febrile, sub-febrile, and afebrile, and + or − to denote the presence or absence of bacillary sputum. Inman's distinction of resting-febrile, resting-afebrile, walking-afebrile cases is the simplest form yet suggested of recording functional ability.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MEETINGS OF SECTIONS.

Tuesday, June 12th.

MEDICINE (Hon. Secretaries—Charles R. Box, W. Cecil Bosanquet): at 5.30 P.M.
Lecture (with lantern demonstration):
Major Aldo Castellani: Tropical Diseases to which the Allied Troops are Exposed in the Balkanic Zone.

Wednesday, June 13th.

OPHTHALMOLOGY (Hon. Secretaries—Kilmore W. Brewerton, A. W. Ormond): at 8.30 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.
Discussion:
On "The Etiology and Treatment of Iritis" will be opened by the President (Mr. Lang).
Other Speakers:—Sir Anderson Critchett, Lt.-Col. Elliot, Dr. John Eyre, Dr. Lakin, Mr. Herbert Fisher, Mr. J. G. Turner, Mr. Colyer, Mr. Frank Kidd, Mr. G. H. Pooley, &c.

SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
FRIDAY.—5.30 P.M., Papers:—Read for Father G. Greggio (Belgian Congo): The Treatment of Yaws and Other Diseases in the Belgian Congo. Dr. R. T. Leiper: A Note on the Integument of the Bilharzia Miracidium.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.
Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—
WEDNESDAY.—4 P.M., Lecture IX.:—Lieut.-Col. Sir John Collie, M.D.: The Management of Neurasthenia and Allied Disorders in the Army. Followed by a discussion.

METEOROLOGICAL READINGS.

(*Taken daily at 8.30 a.m. by Steward's Instruments.*)
THE LANCET Office, June 6th, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
May 31	...	118	71	56	56	63	Fine
June 1	...	105	68	56	56	61	Cloudy
,, 2	...	119	69	54	55	61	Cloudy
,, 3	...	120	67	49	53	59	Cloudy
,, 4	...	119	78	50	56	66	Cloudy
,, 5	...	113	81	57	61	71	Fine
,, 6	...	110	67	55	56	60	Cloudy

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

Offices: 423, STRAND, LONDON, W.C. 2.

MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d*. The rates of subscription remain as revised in October.

INLAND.			
One Year	£1	10	0
Six Months	0	16	0
Three Months	0	8	0
COLONIES and ABROAD.			
One Year	£1	12	6
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Three Months	0	8	9

Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C. 2.

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Entire Page, £5 5*s*.
Special terms for Position Pages.

Advertisements (to ensure insertion the same week) should be delivered at the Office not later than Wednesday, accompanied by a remittance.

The following journals, magazines, &c. have been received:—Archives Médicales Belges, Transactions of the Society of Tropical Medicine and Hygiene, British Journal of Dental Science, Annales de l'Institut Pasteur, Canadian Journal of Medicine and Surgery, Dominion Medical Monthly, British Dental Journal, Albany Medical Annals, Edinburgh Medical Journal, Archives de Médecine et Pharmacie Navales, British Journal of Ophthalmology, Journal of Mental Science, Parasitology, Journal of State Medicine, &c.

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A.—Anglo-French Drug Co., Lond.; Messrs. Arnold and Sons, Lond.; Messrs. Allen and Hanburys, Lond.; Dr. F. S. Arnold; Capt. C. H. Attenborough, R.A.M.C.; Accountant-General of the Navy, Lond.

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Letters, each with enclosure, are also acknowledged from—

A.—Addenbrooke's Hospital, Cambridge, Sec. of; Ancoats Hospital, Manchester, Sec. of; Sir Clifford Allbutt, K.C.B., Cambridge; A. L.

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Y.—Yost Typewriter Co., Lond.

Goulstonian Lectures
ON
PARATYPHOID INFECTIONS.

Delivered before the Royal College of Physicians of London

BY CHARLES HEWITT MILLER,
M.D. CAMB., F.R.C.P. LOND.,
ASSISTANT PHYSICIAN, LONDON HOSPITAL; PHYSICIAN, VICTORIA HOSPITAL FOR CHILDREN; LATE MAJOR (TEMP.), R.A.M.C.

LECTURE III.*

MORBID ANATOMY.

THE number of recorded post-mortem examinations is not large and the accounts of various authorities differ considerably.

Stolkind[1] has collected 100 cases from the literature and his own experience. He divides them into six main groups: 1. 12 cases in which the changes were similar to those of typhoid fever. 2. Over 25 cases of acute gastritis and acute gastro-intestinal catarrh. 3. 10 cases with lesions similar to dysentery. 4. 10 cases of transition forms (swollen follicles and Peyer's patches). 5. In many cases the lesions were the same as in septicæmia. 6. In some cases no lesions were found in the gastro-intestinal canal.

Job and Hirtzmann[2] describe two autopsies on patients who had paratyphoid A fever: 1. Intense congestion of the last metre of the ileum; Peyer's patches not altered; mesenteric glands swollen; spleen enlarged, but not friable. 2. Intestines congested; spleen diffluent.

Job and Ballet[3] describe one case of paratyphoid B and three of paratyphoid A: 1. Paratyphoid B, slight swelling of lymphatic tissue of the small intestine; mesenteric glands swollen; spleen enlarged. 2. Paratyphoid A, one ulcerated Peyer's patch; deep ulceration of sigmoid and rectum; mesenteric glands enlarged and swollen; spleen enlarged and diffluent. 3. Paratyphoid A, Peyer's patches a little raised and pink; mesenteric glands swollen. 4. Paratyphoid A, general congestion of small and large intestine and appendix. They conclude that the paratyphoid organisms have little affinity for Peyer's patches.

Sawasaki describes three varieties: 1. A septicæmic type with swelling of mesenteric glands and parenchymatous degeneration of organs. 2. An enteric type, with swelling and ulceration of the lymphatic tissue of the small and large intestine. 3. Dysenteric types.

Dawson and Whittington, in their series of 17 autopsies, found ulceration of the small and large intestine in 7; ulceration of the large intestine in 2; ulceration of the small intestine in 6; there were also ulcers in the appendix in 2 cases. The spleen was mentioned as being large and soft in 4 cases, large and firm in 3, having abscesses in it in 2, normal in 1 case and small in 1. In these series the ulceration of the intestines was more definite and more extensive than in many cases reported.

Rathery in his large series limits his post-mortem observations to the intestines. In the small intestine he found ulceration of Peyer's patches as in typhoid; there was also very great degeneration of the glandular cells of the mucosa. In a convalescent patient there were atrophic changes in the small intestine and scarring of Peyer's patches. In one case there was a hypertrophic condition of the valvulæ conniventes. In the colon ulcers large and small were found and a hypertrophic condition of the mucosa.

From these various accounts it is possible to say that in paratyphoid infections—

1. The lesions may be the same as in typhoid fever.
2. The large intestine is more commonly ulcerated than in typhoid fever.
3. The intestines may be acutely inflamed throughout their length but the lymphatic tissue may escape.
4. There may be no change at all in the intestines.

MORTALITY.

The mortality is difficult to calculate exactly. For practical purposes the mortality in the vaccinated should be kept distinct from that in the unvaccinated. But with such figures as can be obtained it becomes evident that it is a mistake to regard the paratyphoid fevers as being necessarily mild diseases. For example, Rathery had 74 deaths in his series of cases of paratyphoid B fever. This works out at 6·79 per cent. In Osler's series of 1500 typhoid fever patients the mortality was 9·1 per cent. Willcox gives the mortality for paratyphoid in the Mediterranean Force as 3 to 5 per cent.

There are so many varying factors in the collection of statistics of this kind that it would be unwise to dogmatise about them. It is enough to say that paratyphoid fever is a serious disease and is fatal in an appreciable number of cases. According to Rathery the most frequent cause of death is some cardiac complication. But it is not clear whether he includes under this heading toxæmia and asthenia, which other observers agree are common forms of death. Perforation and peritonitis, hæmorrhage and severe pulmonary conditions will account for most of the other fatal cases.

PROGNOSIS.

Briefly, in those protected by inoculation the prognosis is good. In the uninoculated the prognosis is very far from being good. In the first two years of the war paratyphoid fevers were much more severe than typhoid fever. At that time nearly every man was protected by inoculation against typhoid fever, but paratyphoid vaccination had not come into force. It used to be said that paratyphoid B was a mild disease. I do not think that would be said now. Rathery gives a mortality percentage of 6·79 in his large series of paratyphoid B fevers. Percentages, even of a large series such as his, are not trustworthy. I do not think it can be said that paratyphoid A fever is any milder than paratyphoid B. Certainly the paratyphoid A infections from Gallipoli that I have seen were not mild.

In comparing the statistics of mortality in paratyphoid fever with those of typhoid fever it has to be remembered that the latter are based on observations made on the general population, whereas the statistics of paratyphoid mortality are derived from observations made on soldiers. It is known that typhoid fever is more dangerous in women, in the elderly, and in the obese. It would not be surprising if the paratyphoid fevers were also more dangerous in the same manner. The prognosis for paratyphoid fevers in a civilian population would certainly be worse than among soldiers. These considerations emphasise the statement that paratyphoid fevers could be a great danger to the community, greater, perhaps, than is realised at present.

DIAGNOSIS.

The diagnosis should be made by the clinician and the bacteriologist working together. It is possible for the diagnosis to be made on clinical grounds alone, and the type of the infecting organism may be guessed accurately if the case occurs in the neighbourhood of other cases of known bacteriological infection. When, for example, there is an outbreak of paratyphoid B fever, and a patient is seen who has the symptoms of enteric fever, his infecting organism may be correctly named. But this is not diagnosis. The clinician can diagnose enteric fever, but he must turn to the bacteriologist and ask him which member of the group is at work. If the bacteriologist is unable to find any evidence of infection, is the diagnosis to be given up? The answer is an emphatic "No." The bacteriologist has many difficulties to contend with, and these bacilli do not always behave according to the rules laid down for them.

A diagnosis made on good clinical evidence must stand, but it must not be more definite than "enteric fever." Sometimes only negative laboratory results are obtained during the illness. The positive results may then be obtained during convalescence.

(A.) FROM CLINICAL SIGNS.

The clinical signs on which the diagnosis can be made have been described under the various types of the disease that have come under my observation. No matter under what mask the identity of the disease may hide, it is usually discovered as the illness proceeds. The more obviously "enteric" type of signs and symptoms often appear after the initial form of the disease is a week old. In other cases suspicion may be aroused by the atypical behaviour of the patient, and the bacteriologist can then give valuable assistance. But such cases are likely to be overlooked unless there are paratyphoid patients already under observation. A patient may begin a typical lobar pneumonia and later develop spots, an enlarged spleen, and

* Lectures I. and II. were published in THE LANCET, May 19th and June 2nd, 1917.

[1] Stolkind: Proc. R. Soc. Med., Nov. 23rd, 1915.

[2] Job and Hirtzmann: Bulletin et Mém. de Méd. Soc. des Hôpit. de Paris, vol. xxxvii., iii. S.

[3] Job and Ballet: Ibid., xxxix., iii. S.

diarrhœa; or a patient with an inflamed knee-joint may be suspected of gonorrhœa unless similar joints have been recently seen among paratyphoid patients. The enteric group of symptoms and signs may be present or the majority of them may be absent.

The rash, the spleen, the intestinal disturbance are all of importance but not essential. The most important clinical phenomenon is the slow pulse with a rising temperature. Captain H. F. Marris, R.A.M.C., has described an interesting diagnostic point. He has administered a hypodermic dose of atropine, gr. 1/33, to some of these patients. His results show that if the pulse-rate is quickened the infection is not enteric, but if it remains the same or becomes slower the chances are that the infection is of the enteric group.

The spots themselves are not good diagnostic evidence. There are so many possible causes of skin eruptions, especially in soldiers, that great care is needed in deciding their nature. The spleen also is enlarged in so many diseases that by itself an enlargement is of little value. Intestinal disturbances were so common in Gallipoli that a man without diarrhœa was an exception. But a history of a few days' diarrhœa followed by constipation is a very suggestive point.

Differential diagnosis between the two paratyphoids has not been possible except by bacteriological methods. At one time it seemed possible that jaundice might be a special feature of one and not of the other. But this idea had to be given up. Paratyphoid B was the more frequent cause of jaundice in patients coming from France and paratyphoid A in those coming from the Mediterranean area.

Colitis again went through a similar vogue. I am not concerned now with the speculations as to the original cause of colitis in paratyphoid. It is enough to record that the worst and most numerous cases of paratyphoid colitis were paratyphoid A from Gallipoli; on the other hand, in France paratyphoid B is responsible for the bulk of the paratyphoid colitis.

As regards severity there is nothing to choose between the two infections. It would seem that paratyphoid A is over and done with more satisfactorily than paratyphoid B. The latter tends to be more refractory. Also paratyphoid A adheres more closely to the typhoid pattern than does paratyphoid B. But none of these points can be in any way considered diagnostic of one or the other.

(B.) LABORATORY DIAGNOSIS.

I approach this part of the subject with hesitation for bacteriological examinations are outside my province. The methods employed in the laboratory may be briefly enumerated.

1. *Hæmoculture.* This is the best single method of diagnosing a paratyphoid infection. A positive result may be obtained in the early days of the infection. Campbell[4] says that between the second and sixth days is the best period for finding the organism in the blood. The disadvantage is that the patient may not come under observation until the organisms have retired from the blood.

2. Isolation of the organism from the *urine* is a valuable aid when a positive result is obtained. When the result is negative, as it often is, nothing is proved.

3. Isolation of the organism from the *stools* is a more complicated process. The stools in most cases will contain the organism at some period of the disease. Negative results do not in themselves negative the diagnosis. Positive results have to be proved very carefully before they can be accepted. The disadvantages of the examinations of the stools are considerable. There may be organisms present, such as *B. pyocyaneus* and *B. fæcalis alkaligenes*, which make the isolation of the paratyphoid organisms a difficult matter. The fæces may contain so many allied strains of bacilli that an organism may be isolated that is culturally one of the enteric group, but fails to comply with the serological tests. It is not enough to find a culturally positive paratyphoid organism in the stools. The organism should be agglutinable with its own specific antiserum. If it does not agglutinate, it is difficult to know how to decide in the matter of diagnosis. If the patient has clinically enteric fever, and a paratyphoid organism of this type is found in the stools, is it justifiable to say that the patient has paratyphoid fever? It has been found that these inagglutinable bacilli do in some cases agglutinate in the course of time. The bacillus should also be tested with the patient's serum. Sometimes the bacillus agglutinates with the patient's serum, but not with the stock serum. In this case I think it is justifiable to say that the bacillus is the pathogenic organism of the disease from which the patient is suffering, but until it is found to agglutinate with a specific serum it cannot be named.

All these investigations demand time and elaborate methods to differentiate the organisms. It is enough for me if the patient has enteric fever and a culturally positive paratyphoid bacillus is isolated from the stools, for in all probability a definite bacteriological result will eventually be obtained. These organisms are apparently very highly specific, and there may be different strains that give the same cultural tests but differ as regards agglutination.

4. *The Agglutination Tests.*

It is outside the scope of a clinical study to deal with the disputed points with regard to the agglutination reactions of the patient's serum. Looking at the question from without, it is obvious that there are two factors that create difficulties.

First, there are two principal methods of testing the agglutinating power of a patient's serum, the microscopic and the macroscopic. It is said that these two methods may give the same results or they give different results in an examination of the same patient.

Secondly, the agglutinating power of a patient's serum is, of course, greatly affected by protective inoculation. The agglutinins derived from the vaccination persist for a different length of time in different individuals. Some of those who use the microscopic method state that febrile conditions due to other causes, such as sepsis, can alter the agglutinating property of a patient's serum.

Lastly, there are undoubtedly inagglutinable strains of paratyphoid organisms, and strains that do not agglutinate until many subcultures have been made.

A person who has been adequately inoculated within a year should have agglutinins in his serum. An uninoculated person who has contracted an enteric fever should have agglutinins in his serum. To neither of these statements can be added the words "absolutely without exception." What is the value, then, of the agglutination test in adequately inoculated persons in whom an enteric fever is suspected?

Dreyer and Ainley Walker[5] have answered this question very decidedly. They have described their technique of employing exact quantitative methods in performing agglutination tests by means of standardised agglutinable cultures. They claim that their method overcomes the difficulties introduced by protective inoculation.

"All doubtful febrile cases, of however short duration, occurring in inoculated persons require a quantitative determination of their agglutinin titre for typhoid and paratyphoid bacilli on three or more successive occasions at a few days' interval before the presence of typhoid or paratyphoid infection can be excluded."

"The rise and subsequent fall in the agglutinin titre are in many cases so definite that the diagnosis could never be in doubt."

"The maximum agglutinin titre of active typhoid or paratyphoid infection occurs between the sixteenth and twenty-fourth day, most frequently between the eighteenth and twentieth day."

It is claimed for their method that a diagnosis can be made when no means will reveal the nature of the infection. But the results also emphasise the importance of having special wards for the admission of such cases as P.U.O., influenza, and trench fever until their disease can be diagnosed as enteric or not enteric.

But their methods and results have not been universally accepted, and the question is one on which more will have to be heard before it can be considered settled.

C. J. Martin and W. G. D. Upjohn have called attention to a peculiarity that may be observed in the serum of those who have been inoculated against typhoid. In the early days of the disease infection with one of the paratyphoid organisms stimulated the production of typhoid agglutinins only, and it was not until as late as the third to the fifth week that the titre of the infecting organism rose to 1 in 100.

It is probable that further observations by bacteriologists will throw light on this subject of agglutination and its interpretation, but at present the question is not settled and

[4] Campbell: Journal of R.A.M.C., 1910., xxvi.

[5] Dreyer and Ainley Walker: THE LANCET, Sept. 2nd, 1916.

is not ready for dogmatic statements to be made about it. As an aid to diagnosis at a time when the clinician requires help agglutination is not of much value. A phenomenon which is best seen on the twentieth day or later is not as useful as the isolation of the organism from the blood or excreta.

5. Blood Counts.

It is possible that a very valuable aid to diagnosis may be obtained from an examination of the cells of the blood, particularly by making a differential count of the white cells. The red cells are usually diminished and the resulting anæmia may be severe. But this anæmia is most pronounced in the later stages of the disease and for many reasons does not give any help in making a diagnosis.

It has been stated frequently, but rather vaguely, that in paratyphoid infections there is a diminution in the total number of white cells with a relative increase in the lymphocytes, and that there is a diminution of eosinophiles in the acute stage followed by an increase during convalescence. It would be of the greatest value if these statements could be made more definite with actual figures to support them. The blood counts should be done periodically all through the illness and convalescence in both inoculated and uninoculated persons.

Walker Hall and Adam [6] have published an account of their observations of differential leucocyte counts in enteric and dysenteric convalescents. Their results are full of promise for this means to become a valuable diagnostic measure. They did not observe the eosinophilia that has been described, but they did not attach much importance to this absence, as it may have been due to the coexistence of an amœbic infection. They observed that there was a greater number of eosinophiles in the blood a few weeks after a triple vaccination (typhoid and paratyphoid) than after a pure typhoid inoculation.

But they found that when agglutinin present in the blood was due to inoculation a normal leucocyte count was obtained, while if the agglutinin was due to infection the typical leucocytosis or polynuclear leucopenia associated with the causal organism would be found.

If a differential leucocyte count will decide whether agglutinins are due to inoculation or infection, many of the bacteriologist's difficulties of diagnosis will be removed. Further, such an examination can be done in a short time and the result known when diagnostic aid is required.

But when all is said and done, it cannot be too strongly insisted upon that for practical purposes, in the acute illness, the diagnosis has to be made on clinical grounds. The bacteriologist may be able to give assistance. But if his results are negative, the clinical diagnosis stands. It is true that it cannot be more close than a diagnosis of the enteric group. But that is enough for treatment and for the prevention of the spread of infection. Even if the clinician has eventually to change his opinion, there will have been less harm done than if a positive paratyphoid patient had not been isolated until the diagnosis was certain.

In the stage of convalescence, in the detection of carriers, and in diagnosing "suspects" the matter is more clearly the province of the bacteriologist.

TREATMENT.

No useful purpose would be served by giving a detailed account of treatment. In the pyrexial stage of enteric fever of paratyphoid origin the usual lines of treatment of typhoid fever should be followed. The following are a few points of treatment based on my cases.

Hydrotherapy in various forms is strongly recommended for high fever, but of all measures of the sort I know of none so efficacious and so little disturbing to the patient as tepid sponging properly carried out. It is the most easily and generally used method of treatment not only for high fever but for restlessness and delirium, for the promotion of sleep, and for improving the general condition of the patient.

As regards general hygiene it is essential that the mouth should have proper attention. Antiseptic alkaline mouth-washes are to be preferred to any other. Those containing glycerine should be avoided. The flow of saliva should be promoted. This can be best accomplished by giving chewing gum and by adding such things as rusks and biscuits to the diet, so that the patient can bite and chew.

[6] Walker Hall and Adam: THE LANCET, Sept. 16th, 1916.

Diet.—I do not consider that a strict milk diet is either essential or desirable. Many adults dislike milk; it is difficult to keep the mouth in good order if nothing but milk is taken, and the curd of milk can make a very tough mass in the intestine in these cases. Variety of diet is greatly to be preferred, and it should be of such a nature that the residue will be neither bulky nor irritating. Solids that are easily digested and leave little residue may be employed with safety—with greater safety in many cases than milk. Meat extracts are valuable in stimulating gastric digestion, but must be avoided when there is diarrhœa. By promoting the salivary and gastric secretions much may be done to nourish the patient safely and satisfactorily. It is most essential that the patient should drink plenty of water; small drinks taken frequently are best. A liberal amount of sugar should be given.

The Bowels.

In the severe cases a simple enema was given regularly whether the bowels were open or not. In milder cases liquid paraffin at night, followed, if necessary, by Epsom salts in the morning, was a satisfactory method of treating constipation. When diarrhœa was troublesome, a regularly given saline wash-out of the colon gave the greatest relief. It could be followed three hours later by a starch enema. At the same time the diet has to be revised, and all possible causes of intestinal irritation removed. Arrowroot flavoured with port satisfied any desire for food, and water in plenty would make up for fluid lost. Distension was treated with enemata, calomel, and pituitrin. It was assumed that peristalsis is less dangerous than stagnation.

In the dysenteric cases, apart from any specific treatment by emetine, the treatment of diarrhœa was difficult. Few of these cases received benefit from the administration of saline purgatives; these measures apparently have their best results at the onset of the illness.

The milder cases were given a mixture of castor-oil and chlorodyne which was found to act satisfactorily. In the severe cases, after trying various methods, I found that opium and astringents acted best. Colon washes with saline or boracic were very beneficial; I found no improvement follow the use of colloidal silver solutions. After the wash a starch enema could be given, especially when a few hours' sleep were necessary.

It was found that in all cases of dysentery after the initial stage, a heaped teaspoon of bismuth carbonate taken in the early morning assisted the recovery. It is very important to prevent a convalescent dysenteric from becoming constipated. Liquid paraffin was invaluable in the later stages of the disease.

Collapse from diarrhœa was treated by the administration of fluid by mouth, by rectum, under the skin, and into the peritoneal cavity. The very slowly given saline injection per rectum is, I think, the most satisfactory method when it can be used. Alcohol is also valuable, and camphor injections are of assistance in an emergency. Strychnine I consider harmful and digitalin useless.

In jaundice the irritation of the skin can be eased by local applications, but particularly by the administration of thyroid extract.

In the stage of convalescence attention has to be paid to the diet and bowels. It is very important that the patient should take active exercise as soon as he feels equal to it.

Intestinal antiseptics were disappointing. Chlorine water, solution of potassium permanganate, β naphthol did not seem to have any effect. Better results were obtained from a proprietary preparation with a phenol basis. It had the effect of deodorising the stools and in some cases banished the infecting organism. But it is impossible to say if the organism was banished permanently. The greatest need is for an antiseptic that will disinfect the gall-bladder. It has been said that urotropine has this power, but the statement lacks proof. But as urotropine is of great value in freeing the urinary tract from infection its use might with advantage become more general.

Vaccine Treatment.

I cannot speak from personal experience of any benefit obtained by vaccine treatment, but in the experience of others satisfactory results have been obtained.

Rathery and his colleagues speak very definitely of the results obtained in the treatment of paratyphoid B, which they claim constitute a clear proof of the favourable action

of vaccines. They have obtained positive results, doubtful results, and negative results. The positive results were recognised clinically by an improvement in the patient's general condition, by a lowering of the temperature, by a decrease in the size of the spleen, and by polyuria. The treatment was not used in the early period of the war, during which the cases were more severe; nor was it used in cases of severe asthenia, great splenic enlargement, and coma. But it was used in all other severe cases. They had no accidents or disasters. They give it as their opinion, which is supported by figures, that vaccinotherapy is a useful aid in treatment.

Further observations are necessary before a definite and conclusive statement can be made. But I do not think that anyone would hesitate to say that vaccination has been proved to be more advantageous to the individual as a preventive than a curative measure.

PREVENTIVE INOCULATION.

The question of the value of preventive inoculation can only be decided when all the statistical material has been collected. At the present time it is only possible to give personal opinions and impressions. For my own part, I can be definite about its value. If any evidence were necessary to establish the value of antityphoid inoculation against typhoid fever, the relative fewness and mildness of the cases of typhoid fever in this war would convince all honest-minded men. It has been suggested by Labbé that anti-typhoid inoculation gives a certain measure of protection against the paratyphoid infections. I cannot agree with this suggestion judging from the cases I have seen, and I find that Rathery and his colleagues are very definite in their statement that antityphoid inoculation, even when repeated four times, gives no protection against *B. paratyphosus B.*

Since the triple (T.A.B.) vaccination came into force the number of cases of paratyphoid fever admitted to Netley has decreased appreciably. This feature is of doubtful value, as the Gallipoli campaign has come to an end. But more important is the type of case. It will be admitted that the descriptions of cases and the temperature charts shown indicate that paratyphoid fever can be a very serious disease. In fact, in 1915 it was more often serious than slight. Nowadays it is rare to see a patient with para-typhoid fever who is seriously ill. For six months I have not seen a patient who caused any anxiety. The difference is so great that the enteric wards are now considered the dull part of the hospital, a very great contrast to their condition in the autumn of 1915.

On the other hand, a fair number of men become infected, and though they are not seriously ill they remain in an unsatisfactory, debilitated condition for a long time; but I think that the slowness of the convalescence is attributable as much to the strain of warfare as to the paratyphoid infection. It is noticeable that in all manner of diseases and wounds it takes longer to restore a man to the full vigour of good health than it did in the early days of the war. But this is a complex problem and outside the scope of my subject.

There are two possible disadvantages with regard to para-typhoid inoculation apart from the temporary malaise of the reaction. The first is of great importance and has already been mentioned. The protection of inoculation has so altered the appearance of the disease that it may not be recognised. When one is accustomed to look for a severe condition dangerous to life it is possible that a bad cold in the head will not arrest attention, and yet in the latter other symptoms suggestive of a mild enteric fever may be seen if a proper examination is made. It is probable, then, that one of the results of inoculation will be an increase in the number of undiagnosed mild cases and a proportionate number of undetected carriers.

The second disadvantage is one that will be gladly seized upon by the antivaccinationist. It is possible for a man to have had a very mild attack and remain infected or to be a carrier without any suspicion being raised that he has the infection upon him. If such a man is inoculated he may develop an attack of paratyphoid fever immediately after the inoculation. In the words of the antivaccinationist, the inoculation gave the man the disease, which is quite true as far as it goes; for by lowering the man's resistance for a time the inoculation caused the infection to get the upper hand Such cases have occurred, but they are very rare, and the ill-ness is trivial and runs a short and mild course. In one case, that of an orderly in an enteric ward, one injection of typhoid vaccine was followed by a mild febrile condition, which was found to be paratyphoid B (Chart 1, p. 748).

The duration of the protection given by vaccination varies considerably. Agglutinins may be present in the blood of typhoid-inoculated individuals for many years after inoculation. But in many cases they are on the wane at the end of two years. Paratyphoid vaccination apparently does not give so long a period of protection. Agglutinins begin to disappear at the end of one year or a little later. If agglutinins are to be taken as the measure of immunity, it would appear proper to repeat the inoculations every twelve months.

MODES OF CONVEYANCE OF INFECTION.

1. Personal contact seems to be a method by which the infection of paratyphoid is directly spread. Several instances have occurred in my experience that are incapable of explanation in any other way. I have heard also of small epidemics that are attributed to this manner of infection. The infectivity of paratyphoid organisms is greater is this respect than is that of typhoid. Costa[7] has described two small epidemics that were due to direct infection.

The Carrier.—Intermediate Transmitting Agencies.

2. The main source of infection is the carrier. Carriers will be found in any army that takes the field. Carriers have been found in civilian life that have caused repeated local epidemics. More of these have been reported in continental countries than in England.

Torrens and Whittington have remarked that paratyphoid A fever did not appear in France until British troops from India arrived on the Western front. I did not notice any paratyphoid A infections coming from France during the first year of the war. There had been plenty of cases of paratyphoid B fever from France, but the first case of para-typhoid A fever occurred in a wounded man admitted on Oct. 1st, 1915.

Gallipoli produced a large amount of paratyphoid infection. Paratyphoid B fever was at its height on the peninsula in September and October, but in November paratyphoid A was the more common infection.[8] The conditions at Gallipoli were such that intestinal diseases were rife, and there was every conceivable condition present to assist the dissemination of infected matter. The carriers played the most important part, assisted by intermediate agents, such as flies, dust, and contaminated water. The conditions of existence were favourable to the propagation of disease, for the men were war-worn, exhausted, cramped in a restricted space, and subjected to bad climatic conditions. Sarrailhé and Clunet found that the conditions which favoured the spread of camp jaundice were fatigue, cramping in a confined space, and unfavourable climatic conditions.

The number of intermediate transmitting agencies could be multiplied, but the following have been proved to be of the greatest importance.

1. Flies can spread the disease, both by carrying infected material on their feet, and by ingesting the organisms and passing them out in their excreta. Graham-Smith,[9] in his book "Flies and Disease," writes:—

> The observations which have been quoted show that flies, if suitable opportunities of visiting infected material occur, may carry and distribute organisms of this type for several days. No instances of infection by flies have yet been recorded.

Faichnie[10] in 1909 published the results of experiments which proved that bacteria ingested by the larvæ of flies might be present in the alimentary canal of the adult. He proved this point with regard to *B. typhosus* and *B. para-typhosus A.* The possibility of the contamination of food by flies is so obvious that the part played by the fly in the dissemination of enteric bacilli need not be questioned. Further, good results have followed measures taken by sanitary officers to exterminate flies.

2. Dust can obviously be a method by which infected particles can gain access to the human body. Of the many plagues of Gallipoli, dust-storms were by no means the least.

3. Contaminated water and food will be the final vehicle of infected material to the human subject. Levine and

[7] Costa: Bull. et Mém. de Soc. Méd. des Hôpitaux de Paris, xxxvii., iii. S. [8] Archibald and others: Loc. cit.

[9] Flies and Disease (Non-blood-sucking Flies). Cambridge Public Health Series. 1913. G. S. Graham-Smith.

[10] Journal of R.A.M.C., 1909, xiii., 672.

Eberson [11] have described a small epidemic that was due to the imperfect treatment of milk bottles which had been contaminated by a convalescent paratyphoid patient.

The Problem of the Carrier.

But however numerous are the possible intermediate agents in spreading paratyphoid infection, it has to be remembered that the real cause of infection is the infected human being. In the acute stage of paratyphoid fever precautions are taken to limit the possibilities of dissemination. In the case of the carrier the danger is greater, because it may not be suspected. A carrier may be an individual in perfect health who can mix freely with his fellows. In communities where there is good sanitation and water drainage the dangers of the carrier are lessened. But even in these circumstances epidemics have been traced to an unsuspected carrier. In barracks, camps, and billets the danger from a carrier is greatly increased, and measures have to be taken to prevent the possibility of the contamination of food and water and to protect the individual by raising his resistance to the infection.

The carrier is usually an individual who has had a recognisable attack of enteric fever, but some of the cases are so mild that they are not suspected. These mild cases are the most dangerous from the point of view of the sanitary officer, and they are probably becoming more numerous. Carriers are of different sorts. The majority are those individuals who pass the organisms in their stools. The gall-bladder is commonly a nest for enteric organisms, and there may be periodical discharges of enteric-laden bile into the intestine. Some of these "gall-bladder" carriers have chronic cholecystitis, and they may have recurrent symptoms which may call attention to the nature of their condition. The most dangerous carrier of all is the male urinary carrier. The fæcal carrier may be expected to pass his infective material into a proper latrine whenever it is possible; the urinary carrier will have a much wider range of action.

The carrier is not only dangerous to others, but he is living in danger to himself. At any time he may develop acute symptoms of paratyphoid fever. It only needs some lowering of resistance by fatigue, shock, wounds, gassing, and even inoculation against any infection for the auto-infection to become severe. Such considerations make it impossible to calculate the incubation period of the disease from observations made on troops in the field.

There does not seem to be any time limit for the carrier. In the case of cholecystitis quoted above the patient had contracted his original infection 16 years before, and I have heard of a similar case with a 50 years' interval.

It is difficult to be certain that a patient who has recently had paratyphoid fever is free from infection. There may be many weeks, and even months, in which the examinations of the stools are negative. Thus one convalescent who remained in hospital for the treatment of other conditions had one positive stool on Oct. 7th and another on Feb. 7th; there had been six negative examinations in the interval. On another occasion, during a spell of hot weather, nearly all the convalescents whose stools had been negative for some time had a positive result.

It is obvious that the carrier is one of the most difficult problems of military hygiene. It is certain that when the organisms are found in the excreta a patient is dangerous and must be segregated. But when they are not found, even over a long period, it is not certain that the man is free from infection. Prolonged segregation and repeated examinations are the only measures that can be taken, and they do not give absolute security.

CONCLUSION.

I will conclude by saying that in our campaign against paratyphoid infection we must aim at personal hygiene, good sanitation, preventive inoculation, segregation of carriers, and, on the part of the clinician, early diagnosis.

I wish to acknowledge my indebtedness to the British Red Cross Society for their kindness in permitting me to use the notes on the patients in their hospital. I also desire to thank Surgeon Lieutenant-Colonel Sir Warren Crooke-Lawless, Commandant of the British Red Cross Hospital, Netley, for giving me the opportunity of seeing these patients as well as for many valuable suggestions, and my colleagues, Major H. L. Tidy and Captain H. A. F. Wilson, for their coöperation and assistance.

[11] Journal of Infectious Diseases, 1916, xviii., Levine and Eberson.

AMPUTATIONS CONSIDERED FROM THE ARTIFICIAL LIMB POINT OF VIEW.

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I VENTURE with all diffidence to state my opinions on the relative merits of the various amputations from the artificial limb point of view.

The Upper Extremity.

With regard to the upper extremity, it is possible to fit an artificial limb to any part. One finger or the thumb of the natural hand is more useful than any apparatus. If only the thumb or one finger is left, artificial fingers or an artificial thumb can be fitted, so that the patient has something to which he can oppose the remaining digit.

Amputation of the wrist-joint should not be done if it is at all possible to leave any portion of the hand, for it gives too long a stump for the proper application of an artificial hand. It is necessary to put the artificial wrist-joint at the end of the natural wrist-joint, and this brings the hand too far away from the elbow, and much power is lost.

For officers or patients engaged in clerical pursuits, a new wrist-joint should be made by removal of one and a half inches of the radius and ulna, for to this joint an artificial hand can be fitted, so that the flexion and extension movements are converted into flexion of the interphalangeal joints of the index and middle fingers. This operation shortens the forearm and increases the power of the flexors of the elbow, and replaces the hand as efficiently as is at present possible. The best site for amputation of the forearm is one where the bones are divided at the lower end of the middle third of the forearm, for this gives a powerful useful stump, not too long, and capable of full pronation and supination.

A forearm stump where the ulna measures three-and-a-half to four inches from the tip of the olecranon is often exceedingly difficult to fit with an artificial forearm bucket. The stump repeatedly slips out of the forearm bucket. As the supinator longus, the extensor muscles, and the flexors are useless, these should be removed in order to produce a flat surface upon which the upper and anterior edge of the forearm bucket can rest. This is especially necessary if the forearm muscles are large. If not more than two inches of the ulna (measured from the tip of the olecranon) can be left, the amputation should be performed above the condyles of the humerus.

Amputation at the elbow-joint should never be performed as an operation of election, for it is difficult, though not impossible, to fit an artificial arm to the stump. If it is imperative that the amputation should be through this joint, the condyles must be removed, for if left it is impossible to accurately fit an arm-socket unless it be laced up the whole length of the front, which considerably weakens it.

The best site for amputation of the arm is one between a point one and a half inches above the elbow-joint on the one hand, and three inches below the fold of the axilla on the other, and an endeavour should always be made to divide the humerus between these two points.

It is difficult to fit an artificial limb to a stump which projects only one inch below the fold of the axilla, but it is still more difficult to fit one where the stump does not project at all.

With regard to the shoulder, it is easier to fit an artificial limb to an amputation where the head of the bone has been completely removed than it is to fit one to an amputation through the surgical neck of the humerus. But, in spite of these difficulties, one should always remember that it is possible to fit an artificial limb to any amputation of the upper extremity.

At the shoulder-joint, by means of a moulded leather cap, an artificial arm is adjusted to the body. Considerable space should be allowed between the arm and the chest wall by flattening the inner surface of the arm, so as to facilitate dressing. By adjustable straps and wires, the movements of the opposite shoulder can be utilised to bend the elbow of the artificial arm, and by a similar arrangement, passing round the chest and down the artificial arm to the thumb, the latter can be moved by abducting the opposite arm.

It is interesting to observe that, in spite of the endeavour of the patient to make the utmost use of an artificial arm, nature constantly asserts the usefulness of the remaining member. If the left arm is lost above the elbow there will be a constantly increasing tendency to use the right arm for everything. This is also noticeable to an increasing extent where the right arm has been lost, for the patient will become left-handed and use his left hand more and more wherewith to perform every function.

The Lower Extremity.

Before passing on to a consideration of the amputations for the lower extremity, let me remind you that in all cases, no matter where the site may be, it is essential that the nerve trunks should be cut as short as possible, and that the end of the stump should be covered with a loose movable non-adherent skin-flap.

With regard to the lower extremity, if the amputation has been of the digits and the bone is well covered with the scar on the dorsum, an artificial boot can easily be fitted, and the patient walks well.

A guillotine amputation through the centre of the tarsus should always be looked upon as a temporary measure, to be replaced by a Syme's amputation as soon as the patient has recovered from the effects of the sepsis and can tolerate a further operation.

No skin-grafting of a granulating Chopart gives the least chance of a useful stump. The scar ultimately becomes the lowest part of the foot in consequence of the contraction of the tendo Achillis, and will not bear the weight of the body without ulceration. Months of suppuration have often followed a guillotine amputation performed through the centre of the tarsus. A Syme is ultimutely necessary, and should be resorted to early.

Neither a sub-astragaloid amputation, nor a Pirogoff, gives the most useful foot. In both these amputations the lowest end of the leg is pointed and irregular, the stump is too long, and the artificial foot so narrow as to prevent the ankle-joint being fixed in the artificial foot itself.

A Syme's amputation is the best about the ankle-joint. It should be performed exactly as described by its originator, the malleoli and a layer of the tibia a quarter of an inch thick being removed. This gives room for a joint in the artificial foot itself instead of in the lateral steel supports.

Any amputation through the leg between the ankle-joint (Syme) and a point six inches below the top of the tibia must be looked on as likely to give an unsatisfactory stump, and one which is, therefore, a tentative amputation.

It is permissible in France to perform such an amputation, because it is always doubtful whether the flaps will or will not slough; but such a method gives an unsatisfactory stump which is thinly covered, badly nourished, liable to blueness, anæmia, ulceration, and sinus formation. It is only permissible as a temporary expedient.

The best amputation of the leg is one where the bone is cut four to five inches from the upper edge of the tibia ("seat of election"), where the lower end of the tibia is square, and where it is well covered with healthy movable skin. A patient with such an amputation can carry a considerable part of the weight of his body on the end of the tibia, the remainder being borne by the lateral surface of the tibia and fibula and partly along the surface of the thigh, i.e., the points of purchase of the socket which carries the artificial limb.

After this amputation, with a well-fitting artificial limb, a patient can walk, run, and dance in such a way as to render it absolutely impossible, even for an expert, to decide which leg is artificial.

In this amputation the fibula ought to be cut half an inch shorter than the tibia, otherwise it seems to increase in length and to project. Should, however, the end of the tibia not be well covered with movable skin the weight of the body cannot be borne on the end of the stump, and has to be carried on the lateral surface of the tibia and fibula, the sides of the thigh, and the tuber ischii.

It is imperative that in any amputation at the upper third of the leg the knee-joint should be kept straight, as flexion may render a further amputation necessary, either through the knee-joint, or just above it. If the knee-joint is allowed to become flexed the hamstrings and the posterior ligament contract and shorten, and all these structures, even the posterior ligament, may require division; and even then it may be impossible to straighten the leg, and amputation at or above the knee-joint may be necessary.

Even one inch of the tibia, if well covered on the under-surface, gives a more useful stump than an amputation through or above the knee-joint. Endeavours should always be made to divide the tibia in such a way, and at such a point, as to get a good covering for its cut under-surface. If this is not possible, or if the flaps slough, or if for any reason it is inevitable that there will be a scar over the end of the tibia, it is better to remove the tibia and the patella by some sort of incision similar to that for a Stephen Smith amputation.

In every Stephen Smith amputation the patella ought to be removed, for if left it retracts and forms a wobbling excrescence, which prevents the accurate fitting of a thigh bucket. It is quite easy by means of an accurately fitting leather bucket, fitted with lateral steels jointed opposite the tubercles on the condyles of the femur, to fit an artificial leg to an amputation through the knee-joint. An artificial leg so made and jointed does not cause the projection of the artificial knee beyond that of the normal knee when sitting down, and the gait of a patient wearing such an artificial leg is excellent.

A transcondylar amputation of the femur, if well covered, gives a very good stump, but the edges of the bones should be rounded off, and the periosteum should be pushed up and replaced over the edges of the divided bone. In any amputation above the condyles, up to a point higher than the middle of the femur, the artificial leg should be made with a lacing bucket of leather, not wood. This lacing leather bucket should be made of strong sole leather and should fit accurately to the thigh. The tuber ischii should rest upon its upper edge, so that the patient's weight is transferred to the ground through the tuber ischii and partly through the friction of the skin against the inside of the bucket. As the thigh shrinks the bucket can be tightened in the lacing, doing away with the necessity of having a new bucket fitted or of wearing sometimes as many as a dozen thigh socks.

At or above the middle of the femur every amputation case should be fitted with a pelvic band, which should be accurately moulded to the body before the steel is hardened. It should extend from just below the anterior superior spine on the affected side round the body below the iliac crests to the opposite anterior superior iliac spine. The hip-joint in this pelvic band should be at a point opposite the centre of the great trochanter and half an inch above it. Such a pelvic band prevents the wobbling of the thigh and considerably improves the patient's gait.

Amputations in the upper third of the thigh, where the bone is divided at any point between the small trochanter and two inches below it, give a stump well-nigh impossible to fit with an artificial limb. If more than two inches of bone below the small trochanter cannot be left, then the femur should be divided at the small trochanter or through the great trochanter.

It is easier to fit an artificial limb where the bone has been exarticulated at the hip-joint than it is where the bone has been divided through the great trochanter or at the small trochanter, so that if a long thigh stump cannot be made there need be no hesitation in removing the upper end of the femur, provided, of course, that the condition of the wound as to sepsis and of the patient will allow of this rather more severe proceeding.

SIDMOUTH HOSPITAL FOR DISABLED OFFICERS.—On May 31st the Countess Fortescue opened, at the Sidmouth Baths, a hospital for officers suffering from stiff joints caused by wounds. The treatment will consist of radiant heat, massage, whirlpool and aeration baths, and the use of mechanical appliances. Dr. William Gordon, of Exeter, delivered an address congratulating Sidmouth on taking up a work of real national importance. The use of combined physical methods as an organised system was, he said, due to French initiative, while the efforts of the Balneological Section of the Royal Society of Medicine had resulted in the establishment of centres in this country on the lines of the clinic at the Grand Palais in Paris. Dr. Gordon laid stress on the necessity for early treatment in cases of crippling, the fact having been proved beyond question that great advantage was gained in the massage and manipulation of disabled limbs by the preparatory use of heat.

NEURASTHENIA IN SOLDIERS OF THE HOME FORCES.

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(Report to the Medical Research Committee.)

THIS communication is entirely based on experience gained at the 1st Eastern General Hospital, Cambridge, where I was serving prior to going overseas with my present unit. Its object is to draw attention to the predominance of neurasthenia as a cause of going sick amongst our newly recruited soldiers. I use the term in its widest sense to include disorders of the nervous system which are believed to have no organic basis. No experience that I had gained in civil practice was, to my mind, of more importance than the recognition of the fact that neurasthenia in some shape or form is by far the most common of the ailments for which the doctor is consulted by patients who are up and about and generally following their occupations. Sydenham[1] states that "hysteric disorders constitute one moiety of chronic distempers." Hospital training hardly prepares one for the numerical importance of neurasthenia, nor for the disguises it may assume. I do remember that one of my teachers, Dr. F. T. Roberts, in enumerating the diseases which should be thought of in making a diagnosis of the case before him, was fond of beginning, "Firstly, gentlemen, it may be nothing at all." Equally astonishing as the frequency with which neurasthenia underlies patients' maladies is the fact that in such a large proportion neither they nor their doctors are aware of the true explanation of the symptoms. But the majority of neurasthenics in civil life are keeping at work. I was not prepared, therefore, for the astounding prevalence of neurasthenia in the occupants of beds in a military hospital. The country is suffering an enormous loss of man-power on this account; there is also the great expense of these men's treatment in hospitals, their occupation of precious beds and attention, and there is the moral and physical deterioration of the patient to be thought of. Numbers of my patients have spent far more time in hospitals and convalescent homes than with their units. They are passed from one institution to another, they presently return to their battalions, where they immediately report sick again and are readmitted to hospital. Such a patient was asked: "How long have you been in the Army?" He replied: "Three weeks, sir." "How often have you been in parade?" "Every day, sir—sick parade," he explained. These are not exceptional instances, but they could be multiplied indefinitely and are of daily recurrence at any hospital which admits soldiers from the Home Forces. To a large extent I believe these losses could be prevented.

General Description.

During the last ten months I have had charge of a number of medical beds in the 1st Eastern General Hospital which had carried from time to time between 120 and 180. Into these beds 2240 patients have been admitted in the ten months, of whom 640 came in convoys from overseas and the remaining 1600 were from Home Forces. Out of this last number 509 were thought by me to be suffering from neurasthenia and to be free from any organic disease. It would appear, therefore, that, speaking from an experience of ten months in a Territorial Force Base Hospital, nearly one-third of the admissions into medical wards from Home Forces are for neurasthenia. A large proportion of them realised that they were of a nervous temperament and that this constituted their disability. A larger number were more or less ready to admit that they were nervous, but had not connected their supposed malady with this nervousness.

The remainder of the patients were unwilling to believe that their symptoms were not caused by disease of an organ, and they would not allow that their nerves had troubled them, although I was satisfied of the existence of evidence that they were of neurotic temperament and ailed nothing besides.

With a few exceptions, to whom reference will be made later, they were sure of their unfitness for military service and did not conceal their resentment at being called up. Many produced a treasured note, which certified that they suffered from some physical malady. All of them had the name of some disease ready on their tongues, which had presumably been endorsed by their doctors, civil or military. The doctor has apparently not borne in mind the extreme frequency of the neurotic factor in the production of symptoms and has not taken pains to discover the real source of the ailments. While allowance is made for the responsibility a doctor incurs when he brands a set of symptoms as neurotic, yet it is obvious that the neurasthenic will not begin to get well until he has been persuaded that he is free from any actual disease. This is the first point in treatment. While he is allowed to think that his sensations denote some particular bodily disease his thoughts are centred there and feelings are exaggerated. He is uneasy about his state of health and is persuaded of his unfitness for soldiering.

Though a number of these sufferers from neurasthenia are of average physical development and constitutional vigour, I have met with few whose physique or robustness was beyond the average. If the weight is occasionally excessive it is associated with flabbiness or want of tone. A large proportion are of notably poor physique. Stunted, weedy growth with small chest is common, and some are to be accounted degenerates. A natural lack of constitutional vigour affords excuse for drooping spirits and a sense of comparative unfitness. Supposing that sufficient force of character to disregard this infirmity is not exercised, a vicious circle is established and the physical condition is further lowered by mental disquietude.

This communication only deals with soldiers of the Home Forces, but I should like to allude to the fact that neurasthenia forms a part or the whole of the disability of an astonishing number of men invalided from overseas. A large proportion of those labelled shell shock, D.A.H., rheumatism, and other conditions plainly owe their ailment chiefly to a pre-existing neurotic temperament. Other minor maladies only assume sufficient importance to get the men sent to England, because they are mixed with the neurotic taint. But I have also seen a number of cases of wrecked nerves in men who had previously been above suspicion, and one can well believe that many conditions that have to be borne in the line are calculated to break the stoutest nerves.

Before passing to the enumeration of the symptoms complained of by my patients I would emphasise the point that the neurasthenic individual never confines his account to what might be explained by any one organic disease or by the affection of any one organ. The widespread distribution of his symptoms is the first point in diagnosis. If he makes rheumatic-like pains his chief complaint, he will go on to describe sensations in the head, in the heart, and the general manifestations of the neurotic state.

Bearing in mind the fact that of the patients by whom we are confronted a large proportion will be neurotic, the doctor should not commit himself to the diagnosis of organic disease, supposing there are no objective signs of this, and unless all symptoms present are thus satisfactorily explained. There is something to be said for the method supposed to have been used by an old R.A.M.C. officer. On a sick parade the odd numbers were allowed treatment and the even numbers were returned to duty.

The Story of the Neurasthenic Soldier.

My picture of the neurasthenic is very briefly as follows. In boyhood, perhaps, he began to evince the characteristics of the nervous temperament, and he did not readily accommodate himself to the rough and tumble of school life. Here I would say that although neurasthenia is met with in every social class, very few of my patients had enjoyed the traditional advantage of our old public schools. I am sure that faulty upbringing is to blame in a large proportion. Introspective habits have not been corrected, and they have not been told that their only rule is to play the man. The neurasthenic did not join in games, but he became serious and inclined to be contemplative. He is very often an only son, and parental upbringing has been injudicious. Later the trials of life are not met with philosophic buoyancy, and the mind is constantly occupied by disquieting thoughts. The nervous system becomes over-wrought and over-sensitive, and thus the working of the whole economy is deranged. While the controlling nervous centres are preoccupied and

[1] Allbutt: System of Medicine.

perturbed, it cannot be expected that subservient organs will do their work smoothly. Symptoms can mostly be explained by over-sensitiveness of the nervous system, exaggerated reaction to stimulus and the absence of well-ordered control over the internal organs.

To go on with the story of my neurasthenic soldiers, I have been told again and again that they "have always been obliged to study their healths." In their past lives they had been incapable of any but light or sedentary work. Many of them had felt themselves obliged to abandon one active occupation after another on account of their weakness. A very small proportion of my patients had enlisted voluntarily. Before the date of compulsory service we saw in this hospital nothing to compare with the recent outbreak of neurasthenia. They disagreed with the examining doctor's verdict of "Fit for service," and adduced previous rejections and their private doctor's opinion as to their delicacy.

They start soldiering, then, with the conviction that their strength will not enable them to stand it. They are suddenly thrust into an uncongenial atmosphere, they dislike the work, and find their comrades unsympathetic. It is not surprising that they should be upset at being torn away from their homes and their businesses.

Anything but heart and soul in their military vocation, they are not in the frame of mind to acquiesce in the roughness of the life and in the unwonted physical exercise. Few of them had previously taken hard exercise, so the first march with rifle and pack naturally caused some aching of limbs and other discomforts. Many of them blame their rations for having to go sick, some that they were always unable to endure cold and wet.

A fright put the finishing touch to a number of my patients. After perhaps some amount of questioning, several men confessed that they were afraid of horses. One promising recruit altogether collapsed on hearing his rifle go off. With a few there was at the bottom of their complaints a grievance, such as being ordered to perform menial tasks, or, in the case of officers, failing to get on with their superiors.

But I should like to mention here the fact that my neurasthenics from the ranks have hardly ever complained of inconsiderate treatment from their officers, commissioned or non-commissioned. Whatever finally determined their nervous breakdown, I almost invariably ascertained that they had suffered in a similar manner for years previously.

Symptoms and Signs.

As I have already said, the neurasthenic's symptoms are never limited to one region or to one organ, and there are certain almost universal general symptoms. Weakness, prostration, a feeling of exhaustion, or sudden collapse are invariable, and many of my patients have been sent in on this account alone as suffering from anæmia or some grave constitutional disease.

Want of energy and inability to interest or concentrate themselves are frequent causes of "going sick" amongst those engaged in office work. In contrast to the overseas sufferers from nervous breakdown, none of my patients made insomnia their chief complaint, though sleep was commonly stated to be broken and unrefreshing. As is so typical of the neurasthenic, the morning is always the worst time. These symptoms are all explained by the using up of nerve-force by mental preoccupation. Our minds must be at peace if we are to possess energy and *joie de vivre*. Other symptoms which are common to all neurasthenics, whatever may be their chief complaint, include tremors. These may be shown by the slightest quivering or over-action of the upper lip in speaking, by the rapid vibratory movement of the upper lids when the eyes are closed, or by fine tremors of the extended fingers. These phenomena are of importance because they put the examiner in the nervous track at sight. Violent tremblings and rhythmical contractions of the limbs or whole body are not infrequently seen and in many of my cases have been labelled malarial rigors. These are, of course, only the familiar manifestations of the nervous state of agitation, but patients have told me that when faced with a sudden emergency or call to action their quaking legs have refused to carry them.

Apart from symptoms referable to the heart there are a fairly constant group of vaso-motor phenomena—cold extremities, hot and cold flushes, which are usually described as the feeling of something creeping beneath the skin from the legs to the head, when they reach which giddiness or faintness may ensue. Sweating is a remarkably active function with neurasthenics. Moist palms or soles or steaming body often suggest the diagnosis, and it may amount to literal drenching of the whole body under circumstances of extra mental stress. I have never before seen such large beads of perspiration so covering the whole body as was constantly presented by a case of shell shock. I would here mention that in a neurasthenic patient whose symptoms had only become marked after being buried in the trenches the sweating was always limited to the left side of his face.

A large proportion of my neurasthenics manifested a marked sternal flush and less commonly a heated, suffused appearance of the face.

All my patients either complain of or admit loss of weight. This is of importance, because it seems to lend colour to the idea that they have some physical disease, but it really means nothing more than a wearing of the flesh off the bones from overwrought nerves.

This will be a convenient time to refer to a few signs that I commonly find present on examination. Exaggerated knee-jerks are generally recognised as characteristic of the neurasthenic and can be used to demonstrate to the patient the meaning of nervous over-sensitiveness.

Less generally recognised is a state of the tongue which I find of frequent occurrence. It has exactly the appearance of having been dried as by a cloth, and is thinly sanded or actually coated. Many patients have been treated, because of their tongues, for derangement of the liver or bowels or stomach, when in reality the condition is a nervous one. The old rice ordeal, in which the suspected person's guilt was established by his inability to swallow a mouthful of rice, depends on inhibition of salivary secretion in certain nervous states. These neurasthenics have many complaints to make about their mouths and their tastes. Sometimes the parched state of the tongue causes a characteristic habit in which moistening of the lips or attempts at swallowing are constantly taking place.

I examined most of my patients for the so-called stigmata of functional nervous disease—the concentric contraction of the fields of vision and anæsthesia of particular distribution. In more than half of my tested patients the fields of vision were normal and in those whose fields were contracted the other manifestations of the neurotic state were usually so marked that the test was only of use as confirmation.

Very few of my men were anæsthetic and the areas affected in them were variable—by no means always assuming the glove-and-stocking distribution. The occurrence of any anæsthesia, again, seemed to be confined to the more marked cases and did not help me in the detection of masked neurasthenia. Their pre-occupation of mind makes these people unreliable witnesses for delicate changes of sensation. Moreover, they are very susceptible to suggestion.

Patients' Chief Complaints.

In their order of frequency my patients' chief complaints or the diagnosis with which they arrived in hospital can be considered under the following headings.

Rheumatism.—This is the most common averred cause of disability. Pains in the legs, in the back, and less markedly in the arms are stated to be constant, but to be aggravated by marching. The joints are not necessarily the seat of the pain, and they are free from all swelling and deformity. There is no real limitation of mobility, but the joints are held stiff by obviously voluntary and exaggerated muscular resistance, the patient overdoing contortions of pain when they are passively bent. I should like to speak strongly about the number of these people who have been allowed their rheumatism, who have been ordered expensive treatment and have been sent for long courses of waters and massage and electricity to distant special hospitals. So soon, however, as the patient has been shown that the joints are perfectly free, and when he has been assured that there is nothing but a nervous condition present, it is easy to get these men straight out of bed and walking about the ward. A large number of these men have suffered in the same way before being called up, but in civil life they blamed cold or bad weather for what as soldiers they attribute to marching. A surprising number of these patients claim to have had rheumatic fever in the past. My attention was at once arrested by the frequency, as it would appear, of acute rheumatism in this class. A little scrutiny, however, satisfies me that their

statement cannot be accepted without question. It is elicited that the illness did not particularly affect the joints and that these were probably not swollen, but that the pains were universal, the chest, head, and body being painful. Most neurasthenics have some symptom referable to the heart, and in these people the supposed affection of the heart is connected with the alleged rheumatic fever. In a large number of cases labelled "Disorderly action of the heart" rheumatic fever is stated to have occurred in the past. In my opinion, however, closer scrutiny substantiates the neurotic rather than the rheumatic element.

As I have said, although such patients may claim to be completely incapacitated and are brought into the ward on a stretcher, it is usually particularly easy to get them on to their feet at once and finally dispel the pains.

The same kind of pains may have been called *neuritis*, but there is a complete absence of other symptoms or of signs of nerve inflammation. If such pain happens, for example, to be referred to the region of the sciatic nerve, this can be stretched without characteristically increasing the pain, and no wasting will be discovered. In my own experience careful measurements have helped me more than anything to discriminate between pain of organic and of functional origin. I have often been inclined to make light of a pain complained of in a limb, until my position was saved by the discovery of definite wasting.

Disquietude of mind is by far the most common cause of headache and of backache. A more critical survey of the local and general symptoms, the absence of signs of organic disease, and the manifestation of neurotic indications will usually make it easy to come to a correct conclusion in regard to these people. My point is that the doctor should have prominent in his mind the possibility of his patients' aches and pains being entirely neurotic. A conclusion will be arrived at by finding objective signs of organic disease conspicuously absent, by recognising that all the symptoms cannot be explained by any one organic disease, and that the individual presents manifestations of the nervous temperament. These patients are never easy in their minds, and their overwrought nerves become exaltedly sensitive. In ancient days it was recognised that another nervous state was capable of producing severe pains. Speaking of religious ecstasy, Father Poulain[2] says "the limbs may feel a great fatigue from it," and other ecstatics have "experienced severe pains" in the limbs, the heart, and the throat to such an extent that they were not expected to live. The same sensations are complained of by the neurasthenic soldier, and are equally due to psychic disturbance. A man was admitted to hospital bent down with backache and with painful legs. It was manifest that he was ill at ease, and he confided his grievance. Having originally been a sergeant, on rejoining he found himself a private, and this reduction was allowed to rankle in his mind. On hearing that he had been reinstated in his former position the pains at once vanished and his back became erect.

As a rule it transpires that the subjects of these painful limbs have long been of neurotic temperament, and the trial of a long march concentrates their attention on their limbs and increases their so-called rheumatism.

Gastritis is the term particularly affected by these patients and apparently by their doctors when the stomach is the seat of chief complaint. The name "gastritis" now suggests to me the inference of neurasthenia. I wonder what exact condition the doctor has in his mind when he diagnoses gastritis. Anyhow, the symptoms usually presented by these patients are pains about the stomach or perhaps elsewhere in the abdomen. These are brought on by food—especially by Army rations—and also by marching or by any upset. Tenderness is often exaggerated and mere pinching of the skin may give pain. The patient complains with much insistence of vomiting, which recurs in small quantities which are jealously preserved for the doctor's inspection. Dyspepsia does not present such a picture and the examination of the contents of the neurotic stomach gives no evidence of disease. Flatulence and pyrosis may be complained of and the tongue is furred. Constipation is the rule, but there may be nervous diarrhœa. A little investigation suggests that nervous disturbance is probably at the bottom of everything.

The Heart.

The heart, I should say, was the seat of some sensations in all neurasthenics, whatever may be the main complaint. Pain is complained of and is usually well below the heart, quite away from the common seat of anginal pain. It is generally a more or less continuous sense of discomfort, which is increased by exercise or by excitement. Palpitation, dyspnœa, giddiness, or actual faintings, together with the neurasthenic's general symptoms already described—are, in my opinion, also almost constantly present in all neurasthenics. These are the symptoms comprised by the condition termed "D.A.H." or "Soldier's Heart," which have been studied and described by the observers at the Hampstead Military Hospital.

The majority of my neurasthenics placed dyspnœa in a prominent place among their volunteered symptoms, and all but a very few answered a question about it in the affirmative. I am aware of the very important work that has been done[3] at the Hampstead Hospital on dyspnœa in some of their patients, and of the discovery of chemical changes in the blood. I can only state emphatically that most of my 500 neurasthenic soldiers presented this symptom. I think I can say the same of neurasthenics whom I have seen in civil practice. Certainly, also, my neurasthenic soldiers admit to having experienced all these symptoms of D.A.H. in different degrees before they enlisted. Time has not allowed me to keep more than rough notes and I cannot give detailed percentages. In my cases this would anyhow be difficult, because the same symptoms recurred almost constantly, it only being a matter of their differing in degree. I have observed the same general tendency to increased pulse-frequency in my neurasthenics as studied at the Hampstead Hospital and the same over-ready reaction to exercise and to excitement. Many of my patients appeared to maintain a rate of 100 or even more during all their waking hours, whatever means I took to secure their composure. During sleep, however, this frequency disappeared. I found the subjects of habitually rapid heart action particularly unamenable to treatment. Respirations were also generally quickened and preserved the usual ratio to pulse-frequency. I looked upon these conditions as being due to over-excitability of the cardiac and respiratory nervous centres.

The exclusion of any evidence of enlargement of the heart and the other negative conclusions arrived at by the workers at the Hampstead Hospital, after submitting their patients to examination by experts using every method of precise diagnosis, is most important. My own exclusion of organic affection of the heart was only based on ordinary clinical methods.

Amongst my civilian patients a common complaint has been a sense of inability to draw enough breath into the chest or to get it deep enough. This purely subjective difficulty has not been mentioned by many of my soldiers.

Nothing is more characteristic of the neurasthenic patient, especially where the heart is the seat of the prominent symptoms, than proneness to giddiness or actual fainting. I should say that the exciting cause is much more often emotion than exercise. From the description commonly given by the patient I imagine that the heart's action gets more and more tumultuous and rapid, until a kind of panic seizes him and he loses self-control and even consciousness. The brain cannot work with such a disturbed state of circulation; it is, so to speak, put out of its stride. I am absolutely in accord with Dr. Lewis in thinking that the word "heart" should not be used in the designation of these cases. The whole point is to reassure the patient as to the absolute soundness of this organ. I imagine there is some objection even to keeping them in a special hospital for diseases of the heart, though this objection is outweighed by the opportunity that has been given for the carrying out of the most valuable researches by the Hampstead Hospital staff. Personally, I soon abandoned the term "D.A.H.," and used instead the name "neurasthenia" for the whole class, without specifying from which organ the most prominent sensations arose.

I do not, however, agree with the proposed provisional term of "effort syndrome," because in my experience emotion is a more powerful cause than effort. Many of my soldiers could get no further with their drill than assembling on parade. A striking instance came before me recently in Norwich. A man who had been a gardener was called up

[2] Religion and Modern Psychology. J. Arthur Hill.

[3] Papers and reports by Dr. T. Lewis, Captain Cotton, J. Barcroft, T. R. Milroy, D. Dufton, T. R. Parsons, Major J. C. Meakins, Captains J. Parkinson and E. B. Gunson, Lieutenants J. G. Slade and A. E Drury, in British Medical Journal and Medical Research Committee Reports.

for service. He had been of highly nervous temperament since boyhood and dreaded being taken away from his village home. He fainted on his first parade and was in hospital in Edinburgh for some weeks. He rejoined his unit, fainted again, and was readmitted to hospital, this time for some months. At the end of this time he was invalided out of the Army with a good pension as permanently unfit from disease of the heart. During my examination his pulse-rate varied between 160 and 112 and his respirations between 40 and 28. The case was a distressingly marked one of general nervous perturbation, but it had this exceptional sequel. A few weeks later he wrote to me saying that he felt much better on being persuaded that his heart was sound, and, realising that an error had been made, he had renounced his pension and returned to work. I have now under my care a soldier whose cardiac and other neurotic sensations were tolerable until gas-helmet drill took place. Though there was no chemical in the helmet he felt overcome and fainted. On admission he was tremulous and overstrung, but the prominent symptoms were rapid heart action and respirations, which were increased by walking, but resumed their old ratio within two minutes after exercise. Nor do my observations bear out the theory of infection or toxæmia as the causes of these cardiac symptoms. I have already referred to my impressions as to the importance to be attached to the patient's statement that he has had rheumatic fever.

I grant that many patients are inclined to date their symptoms from some illness, and that of course many diseases do depress all functions, but in most cases evidence can be found of pre-existing nervousness. Further, an equal number of my patients have attributed their symptoms to an operation, which was required for some purely local trouble, such as hernia. An illness or an operation provides a more interesting reason for a breakdown than a fright or an injury to the feelings. And may not the illness which has been accounted the cause of the toxæmia have been in reality another manifestation of the neurasthenia? Undoubtedly the thermotaxic centre is as readily disturbed from nervous agitation as other parts of their mechanism. As regards other poisons, my notes bear out the conclusions of Dr. Lewis and his collaborators in regard to the much-blamed habit of cigarette smoking. Many of my patients who presented the described symptoms to a marked degree belonged to that serious-minded class of persons who eschew all forms of indulgence, except, perhaps, that of being doctored.

Alcohol is certainly productive of a particular type of nerve disturbance, in which remorse perhaps plays a part, but in these cases there is always the probability of some organic damage having occurred.

I have been on the look-out for any indications of thyroidism in these men, but in only two of the whole number was there any enlargement of the thyroid gland. In these two cases, apart from the common symptoms of excited action of the heart, tremors, and nervousness, there was more interference with nutrition and general health than in the typical neurasthenic. Their pulse-rate did not diminish during sleep in the same manner as did that of the neurasthenic. Moreover, though increased pulse-frequency is the rule in neurasthenia, I have notes of several cases with marked cardiac symptoms whose pulse-rates were slow under ordinary circumstances. Like my other cases, exercise produced an enhanced effect on pulse- and respiration-rate, which was recovered from in about three minutes.

Other Complaints.

Lung disease.—A considerable number of my men came labelled "Tuberculosis." Apparently the complaint of pain in the chest, of some difficulty of breathing, or of a streak or two of blood in the phlegm are thought sufficient grounds for mentioning this disease. Then such loss of a little weight and of strength, with a tendency to sweat, as are characteristic of neurasthenia become fastened on as corroborative evidence. Here we can take advantage of an outside verdict from the bacteriologist, instead of being obliged to ask the suspicious patient to take our word for his soundness.

The bladder is frequently the organ thought to be affected. Micturition is said to be frequent, or difficult, or unrestrainable. Backache is often associated with these symptoms. Nocturnal incontinence does not occur, and it is notorious that the complex act of micturition can be easily deranged by nervous states.

The throat is very commonly the seat of a variety of distressing symptoms in neurasthenia, but amongst my soldiers functional aphonia has been the only phenomenon met with as the prominent complaint associated with the throat.

The sexual organs have also been much less frequently involved with the soldiers' neurasthenia than with that of the civilian. With the soldier the organ which happens to be brought into use by his new work is the one that obtrudes itself on his sensations and begins to be surrounded by symptoms of suspected disease. In several of my patients the exacerbation of their neurasthenia could be traced to their consciences pricking them because they had contracted venereal disease.

Prevention.

I will touch very briefly on prevention and treatment, but I do want to call attention to my conviction that a great deal of neurasthenia must be laid to the door of the doctor who fails to make a strictly correct diagnosis and who does not disabuse the patient's mind of his apprehensions about the presence of organic disease. "The next best thing to a good physician is none at all" applies forcibly here. An officer was recently admitted under my care, whose chief complaint was of general weakness and sense of fatigue. He was also liable to giddiness and threatenings of faintness. All these symptoms were confidently stated to be due to weakness of the heart. I found no suggestion of disease about this organ, but a slight overaction of the upper lip in talking and a certain constraint of manner and of expression demonstrated nervous perturbation. Amongst other sources of worry he admitted being concerned about his heart. To my attempts at complete reassurance on this score he objected that nine doctors, including colonels, majors, and civilians, had told him that his heart was affected. As I was unable to convince him we agreed that he should consult a specialist, but, unfortunately, he did not help matters. He satisfied the patient that his heart was free from any suspicion of disease, but he gave him a certificate which stated that there was a particular tendency for the big vessels to become over-filled and drain blood from the brain. So the patient was left his physical infirmity to nurse. Whereas it is my opinion that if he had been assured that nothing ailed him except the effects of worry, he would soon have been relieved of all his symptoms.

In general the prevention of neurasthenia comes within the sphere of education. All social classes are affected, and I think my officers' ward has as large a proportion of neurasthenics as my other wards. But I do think that the class who furnish the greatest number are they whose education has been carried a little farther than that of their general station, but not yet far enough.

> "We knew too much, but not quite enough,
> And so we went to the wall."

The atmosphere of our public schools, in which character and manliness are developed side by side with learning, seems to prevent neurasthenia. A large number of my patients had followed sedentary occupations up to the time of joining, and even those who conscientiously wish to serve their country are over-taxed by being called upon to do strenuous exercise without any training. I am sure there would be fewer breakdowns amongst recruits if they could be better classified and gradually got on to full drill. It is everything with these men to establish self-confidence.

Treatment.—Prognosis.

Treatment seems to me to resolve itself into an attempt to remove from the mind whatever is the disturbing influence. The doctor's first task, therefore, is to gain the patient's confidence and discover the nature of his troubles. A careful physical examination should always be made, and in the large class where fear of some dreadful disease has been preying upon the mind reassurance on this point may be all that is required to give them a good start on the road to recovery. It is well worth the doctor's while to explain how mere loss of peace of mind can bring about each of their symptoms.

In many cases much patience is called for, and, of course, experience helps in the search for the cause. These people seem to go out of their way to delude themselves, and in good faith deny any worry when the existence of such is patent. I am reminded of a soldier who over and over again assured me that he was perfectly happy and easy in his

mind, and I could get no confirmation of my conviction that he was worrying. When it came, however, to his being discharged from the hospital he earnestly pleaded for some furlough. If he went home he could, he said, arrange a favourable sale of some land, which would otherwise mean a heavy loss to him.

Not only can the doctor, in all probability, show the patient that he has been taking the trouble unnecessarily much to heart and inculcate fortitude and equanimity, but he can do more. As Dr. W. H. R. Rivers pointed out to me, the mere unburdening of his soul confers relief on the patient. There may be more than we think in the act of confession.

On exhorting my neurasthenic soldiers to disregard their sensations and stick to their duties, I have often been answered by "I cannot do more than my strength allows." Broadly speaking, occupation is better for these people than rest. So with Colonel J. Griffiths's kind permission, these men were taken for daily and gradually increasing marches by a sergeant. Those who fell out were examined by me at once and it was easy to demonstrate to them their increasing abilities.

I will not attempt to answer the question, "What proportion of these men can be made into soldiers?" Not a few of my confirmed cases were made to see the error of their ways and returned to their units determined to do their bit. But in the case of the majority I cannot believe that real fighters will ever be made of them. The lifelong neurasthenic is not likely to endure cheerfully the privations and hardships of campaigning and will prove more of a nuisance than a help to his regiment. Nor can the neurasthenic be fired with the spirit required in attack and the willingness to make the supreme sacrifice. But there should be plenty of work at home or behind the line of which they are quite capable and which, after a little treatment perhaps, they should perform efficiently.

In conclusion, I must express my indebtedness to the sisters and nurses of my wards at the 1st Eastern General Hospital. Many observations and records were made entirely by them, and the burden of maintaining the right spirit amongst my neurasthenics and finding occupation for them fell entirely on their shoulders.

I have also to thank Dr. L. E. Shore, who had charge of the department for the diagnosis and treatment of nervous diseases and whose ready and skilful help was of the greatest assistance to me. He relieved me of what would otherwise have often been an uncomfortable responsibility when I ventured to exclude an organic disease supposed to be in existence.

NOTE ON

THE TREATMENT OF NEURITIS,

WITH SPECIAL REFERENCE TO SCIATICA.

BY HARRINGTON SAINSBURY, M.D.LOND., F.R.C.P. LOND.,

PHYSICIAN IN CHARGE OF WARDS AT THE BERMONDSEY MILITARY HOSPITAL, LADYWELL.

[THE treatment about to be recorded was recommended to me by Dr. HUGH WINGFIELD, of Welbeck-street. I have endeavoured to induce him to record his experience of its application, but since he has been unwilling to comply, and has suggested that I should undertake this, I have consented; it is, however, his treatment from beginning to end.]

At all times sciatica is apt to be an obstinate affection, so much so that, as one authority has put it, its treatment, or rather its resistance to treatment, has come to be regarded almost as an *opprobrium medicinæ*. It is for this reason that I am anxious to draw attention to Dr. Wingfield's treatment, which in its simplicity of procedure leaves nothing to be desired, and in its effectiveness has been so encouraging thus far that it is to be hoped others will be induced to give it a trial and thus test its efficacy. An additional reason for giving prominence to the method at the present moment will be found in the considerable prevalence of neuralgias and myalgias among our invalided soldiers.

The treatment consists in the direct application of the strong hydrochloric acid of the B.P., in common parlance fuming hydrochloric acid, to the skin, along the line of the inflamed and painful nerve. The acid in question contains 31·79 per cent. of gaseous hydrochloric acid and has a specific gravity of 1·160; in our text-books it is written down as an *escharotic*. That this acid should be capable of safe application to the bare skin will probably come as a great surprise to a good many who, like the writer, had been accustomed to treat it with great respect as a corrosive acid. The *modus operandi* is first to mark out the line of the nerve pain and tenderness as it happens to present itself in the individual. Sir William Gowers describes the areas of pain in sciatica as "usually most intense in certain spots—(1) above the hip-joint, near the posterior iliac spine, (2) at the sciatic notch, (3) about the middle of the thigh, (4) behind the knee, (5) below the head of the fibula, (6) behind the external malleolus, (7) on the back of the foot." These areas are to be selected when present. In general the practice of the writer has been to carry a broad line of application, some 1½ inches across, straight down the back of the thigh from the gluteal fold to the popliteal space; another application of like breadth for about 3 inches behind the head of the fibula along the oblique course of the external popliteal nerve at this spot; lastly, for some 5–6 inches behind the external malleolus directly downwards; and below the malleolus obliquely on to the dorsum of the foot. The extent of the tenderness will guide more or less as to the extent of the application. A wad of cotton-wool, firmly compressed into a knob of the size of the knuckle of the middle finger, is used to suck up the acid, of which about half a drachm to a drachm will be required. The charged wad, grasped by the finger and thumb (previously vaselined [1]), is then carried gently along the line of application above described. The degree of firmness may be increased subsequently if necessary, and the part may be painted two or three times at one sitting if the skin bears the acid well; the first application should be light and single in order to gauge the sensitiveness of the part, and if the integument happens to be thin and delicate it should receive correspondingly light treatment: Dr. Wingfield prefers to apply the acid with a camel-hair brush. A considerable smarting is sometimes complained of; in other cases little more than a tingling or sense of mild heat is felt. After the application a light covering may be thrown over the part till the skin is dry. The smarting soon passes off and the slight redness induced disappears also; no dressing is required. Rarely, in delicate skins, is a papular rash excited; it should be allowed to subside before re-application of the acid. Blistering has not been observed either by Dr. Wingfield or the writer. The treatment may be repeated twice a week if need be, perhaps oftener; it should be continued so long as the pain and tenderness continue. Massage may with advantage supplement the treatment, and particularly if there have been obvious wasting.

In three cases of sciatica recently admitted into the Bermondsey Military Hospital, Ladywell, the results have been striking and greatly appreciated by the patients themselves. Two of these were bad cases of long duration, and in one there was marked wasting of the muscles of the leg and thigh. Dr. Wingfield has had equally good results in sciatica and in the neuritis of other nerves also, and only once, in a case of neuritis of the upper arm, does he recall the occurrence of a troublesome rash, lasting about 14 days; this he attributed to a too free use of the acid. Amongst his cases he records a case of a neuritis of the arm accompanied by an acute eczema which prohibited the use of the acid; in this case he got rid of the eczema by the application of oleum Deelinæ, and having done this was able to apply the acid and cure the neuritis. These cases occurred for the most part in his past practice when physician at Winchester.

How does the acid act? It cannot be by virtue of its acidity—i.e., its power to neutralise alkalinity—for there is no alkali to neutralise on the surface of the skin, and the power of penetration of the integuments by this highly volatile acid, free to evaporate without let or hindrance, must be minimal indeed. Neither can it be due to its power to act as a counter-irritant, thereby deriving blood to the surface (*ubi stimulus ibi afflluxus*), and at the same time sending centripetally, for all they are worth, its sensory stimuli, the objections being that the afflux of blood observed is very slight and very transient (the development of a persistent congestion or mild inflammatory state is quite exceptional), and that the actual nerve irritation produced is

[1] This precaution is advisable if one should be applying the acid frequently, otherwise the skin of the finger and thumb tends to resent the repeated irritation

far below that which iodine and other established counter-irritants set up, with such disappointing results in respect of the cure of neuritis.

The explanation we must leave for the present, the point to arrive at now being the establishment, on a large experience, of the clinical value of the acid in the treatment of sciatica in particular and of neuritis in general, and, perhaps, of that nondescript class of complaint, now so prevalent and so troublesome, labelled "myalgia." Some cases of the last-named class—e.g., lumbago and allied painful conditions—have responded encouragingly; but at this stage it would be unwise to make too wide the terms of reference of this remedy: let the *fiat experimentum*, therefore, limit itself to sciatica and other forms of well-defined neuritis. The value of hydrochloric acid in these affections being confirmed, the investigation of the relative value of other members of the group of acids should follow naturally. The group is a large one, so large that perhaps it would be best to proceed next to the congeners of hydrochloric acid—viz., the other halogen compounds, hydrobromic and hydriodic acids. Though, according to the opinion of some, pharmacology be but an alluring madness, let there be "method in't."

Wimpole-street, W.

FREUD'S PSYCHOLOGY OF THE UNCONSCIOUS.[1]

BY W. H. R. RIVERS, M.D. LOND., F.R.C.P. LOND., F.R.S.,
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THE usual course of scientific progress has been well exemplified, though perhaps in an exaggerated form, by the history of the theory of the unconscious put forward by Sigmund Freud, of Vienna. Few scientific theories escape the fate of being pushed by their advocates beyond the positions which they are fitted to hold, with the result that, failing to fulfil the expectations thus aroused, their merits are underestimated or they are even thrust into the limbo reserved for dead hypotheses, only to be rescued therefrom by some later generation. If we are to trust the contemporary medical literature of this country, this fate is now in store for Freud's theory of the unconscious. His views, or perhaps rather their applications, have stirred up such a hotbed of prejudice and misunderstanding that their undoubted merits are in serious danger of being obscured, or even wholly lost to view, in the conflict produced by the extravagance of Freud's adherents and the rancour of their opponents. This paper is an attempt to deal with the subject dispassionately from the point of view of one who has only temporarily been drawn by current events into the neighbourhood of the maelstrom of medical controversy.

Scope of Application of Freud's Theory.

The first point which may be noted is that Freud's theory of the unconscious is of far wider application than the perusal of recent medical literature would suggest. It is true that Freud is a physician and that he was led to his theory of the unconscious by the study of disease, but his theory is one which concerns a universal problem of psychology. If it is true it must be taken into account, not only by the physician, but by the teacher, the politician, the moralist, the sociologist,[2] and every other worker who is concerned with the study of human conduct. Not only does the medical controversialist fail to recognise that he is dealing only with one corner of the subject, but too often he looks on the whole matter entirely from the so-called practical standpoint and judges a theory of universal interest by the consequences which follow the application of the theory in the hands of the more extravagant of its adherents. It is possible, even probable, that the practical application of Freud's theory of the unconscious in the domain of medicine may come to be held as one of its least important aspects, and that it is in other branches of human activity that its importance will in future be greatest. I may perhaps mention here that my own belief in the value of Freud's theory of the unconscious as a guide to the better understanding of human conduct is not so much based on my clinical experience as on general observation of human behaviour, on evidence provided by the experience of my friends, and most of all on the observation of my own mental activity, waking and sleeping.

Unconscious Experience: Individual and Ancestral.

In the mixture of invective and witticism which may pass for a serious contribution to the subject in the medical literature of this country, an objection frequently put forward is that in postulating unconscious mental states Freud is putting together incompatible and contradictory ideas. One possible course is, that those who make this objection should see whether it is not possible to enlarge their conception of the mind, but to those who find this quite impossible a way out of the difficulty may be suggested. It would be an advantage if, instead of speaking of unconscious mental states, we were to speak of unconscious experience. Everyone would acknowledge that adult human beings have been the subjects of a vast body of experience of which they have no manifest memory, which does not enter into their manifest consciousness. Everyone would, I think, also be prepared to acknowledge that this body of unconscious experience influences our thoughts and actions, our feelings and sentiments. When we speak of such unconscious experience, we are keeping within the realm of obvious fact, although we are ignoring the problem concerned with the form in which the experience exists. Whether this unconscious experience is, or is not, to be included within the connotation of mind is largely verbal and depends on the definition of mind which we adopt. Since the science of psychology has until lately been almost exclusively concerned with problems of definition and description, it is natural that such a concept as that of Freud should meet with opposition, because it does not fit immediately into current systems of definition. The matter will perhaps become clearer if we consider the closely related body of experience which we term heredity. This term is only the name we have adopted for ancestral experience. When we discuss whether a given phenomenon, such as a morbid mental state, is due to heredity, what we really mean to discuss is how far the morbid state is the consequence of the experience of the ancestors of the patient. There have been those, such as Hering and Samuel Butler, who have extended the connotation of a psychological term so as to include this ancestral experience, and have regarded heredity as a species of memory. According to the more generally accepted usage this vast body of unconscious experience is not thought of as a whole in psychological terms. There are, however, certain elements in this ancestral experience which psychologists have singled out from the rest and have termed instincts, and they are agreed in holding that instincts form part of the subject-matter of psychology. If such unconscious elements derived from ancestral experience are by universal assent included within the scope of the mind, it is rather difficult to understand how it is possible to exclude unconscious experience acquired in the lifetime of the individual. It would be humorous if it were not pathetic, that many of those who object most strongly to Freud's views concerning the rôle of unconscious individual experience in the production of abnormal bodily and mental states should be loudest in the appreciation of the part taken by that ancestral experience for which they use the term, too often the shibboleth, heredity.

Mental Conflict.—Dissociation.—Sexual Experience.

Far more important than the largely verbal question whether the unconscious influences which mould our conduct are or are not to be regarded as constituents of the mind, is the question concerning what distinguishes Freud's theory of the unconscious from other theories which deal with this subject. A favourite statement concerning Freud's theory is that its fundamental idea is mental conflict. Standing out prominently in the system of Freud is the idea of conflict between the mental tendencies of the individual and the traditional code of conduct prescribed by the society to which the individual belongs. This conflict, however, was fully recognised by psychologists long before Freud. If this idea were the chief characteristic of his theory, no great claim for novelty or originality could be advanced. If a writer were to point to conflict as characteristic of human society, few would regard the proposition as either profound or especially illuminating, and the idea of mental conflict is in much the same case. The feature which makes Freud's theory noteworthy is his scheme of the nature of the

[1] A paper read at a meeting of the Edinburgh Pathological Club, March 7th, 1917.

[2] Cf. Sociological Review, 1916, ix., 11.

opponents in the conflict, and of the mechanism by which the conflict is conducted.

Another concept characteristic of Freud's psychology is that of dissociation, but here again the idea is older than Freud, and forms part of systems of psychology very different from his. The special merit of Freud's theory in this respect is that it provides a psychological theory of dissociation, of the factors upon which it depends, and of the processes by which its effects can be overcome. There is much to be said for a view which would regard as the distinctive feature of Freud's system his theory of forgetting. According to the views long current in psychology, forgetting is a passive process which stands in no special need of explanation. According to these older views, experience is remembered in so far as it is frequently repeated and according as it is interesting and arouses emotion, pleasant or unpleasant. It has been frequently recognised, however, that it is forgetting rather than remembering which needs explanation. It is, perhaps, the greatest merit of Freud's theory that it provides us with such an explanation. According to Freud, forgetting—and especially the forgetting of unpleasant experience—is not a passive but an active process, one in which such experience is thrust out of consciousness and kept under control by a mechanism, which by a metaphorical simile Freud has termed the censor. This censorship is supposed to act as a constant guard, only allowing the repressed experience to reach consciousness in sleep, hypnotism, and automatic or other states in which the normal control of the censor is removed or weakened. Even when the censor thus permits the repressed experience to become manifest, the experience is often only allowed to show itself in an indirect and often symbolic manner. It is this belief in a process of active repression of unpleasant experience which is the special characteristic of Freud's theory of the unconscious, and it is his doctrine of the part taken by such repressed experience in the production of bodily and mental disorder which is the leading feature of his theory in its relation to medicine. According to Freud many morbid mental states and many bodily states dependent on mental disturbance are due to a conflict between bodies of repressed experience, now usually called "complexes," and the general personality of the sufferer.

Still more important than nomenclature or theoretical basis as a cause of prejudice and misunderstanding has been the stress which Freud and his followers have laid upon sexual experience as the material of morbid complexes. In his theory Freud uses the term "sexual" with a far wider connotation than is customary, using it to comprise anything which is either directly or indirectly connected with the process of reproduction. His followers, however, and to a large extent Freud himself, have become so engrossed with the cruder side of sexual life that their works might often be taken for contributions to pornography rather than to medicine. In some of Freud's followers this absorption in the sexual has gone to such lengths that perverse tendencies and prurient ideas are scented in every thought, waking or sleeping, of the patients who come under their care. To a certain extent this excess is a reaction from the timidity and prudery of the great mass of the medical profession in relation to sexual matters, and is a kind of protest against the ignorance of this side of life which so often exists. The mistake which is now being made by many is to regard this excess as a necessary part of the Freudian scheme instead of an unfortunate excrescence, probably due in large measure to the social environment in which the theory had its origin. There are even those who are so obsessed by the sexual aspect of Freud's psychology that they regard sexuality as its basic principle and have fallen into a state of mind which wholly blinds them to its merits.

Evidence afforded by the War.

It is a wonderful turn of fate that just as Freud's theory of the unconscious and the method of psycho-analysis founded upon it should be so hotly discussed, there should have occurred events which have produced on an enormous scale just those conditions of paralysis and contracture, phobia and obsession, which the theory was especially designed to explain. Fate would seem to have presented us at the present time with an unexampled opportunity to test the truth of Freud's theory of the unconscious, in so far as it is concerned with the production of mental and functional nervous disorder. At least one redeeming feature of the ills which have resulted from the shocks and strains of the war would have been the opportunity they present of settling many problems concerning the nature and treatment of functional nervous disorders, and thus we might be helped in our endeavours to cope in the future with the similar states which follow the more ordinary strains of our modern civilisation. In my opinion this hope, so far as Freud's theory and the clinical methods founded upon it are concerned, is largely doomed to disappointment and I propose to consider briefly why this should be so. In my own experience, cases arising out of the war which illustrate the Freudian theory directly and obviously have been few and far between. Since the army at the present time would seem to be fairly representative of the whole male population of the country, this failure to discover to any great extent the cases with which the literature of the Freudian school abounds might well be regarded as significant. If my experience is a trustworthy sample, it would seem as if the problem was already well on the way towards settlement. Freud's psychology of the unconscious and the clinical methods founded upon it would seem to be proving themselves inadequate as a means of explaining and treating those disorders for which the theory was originally designed.

There are, however, certain features of the situation which must be taken into account before we should accept any such conclusion. First, it must be noted that, while the proportion of the population from which cases of war-strain are now being drawn is very large, it is not wholly representative, but has been selected, though in a very rough manner, by the medical examination preliminary to enlistment. There is some reason to think that many persons who would be likely to support the Freudian point of view, have for one reason or another escaped inclusion in the Army, or if they have joined are given work which does not expose them to the more severe shocks and strains of warfare. Another and more important reservation depends on the fact that warfare tends to produce states of anxiety and apprehension so deep-seated and far-reaching that they obscure causes of a different kind. Cases arising out of the war do not for this reason furnish satisfactory material whereby to test the truth of the Freudian position. Persons who break down under the strains of ordinary life in whom other states are not hidden by the overpowering emotional conditions arising out of modern warfare provide material which shows far more readily the influence of unconscious factors of the kind which are held to be so important by Freud and his school. Even when these reservations are taken into account, however, there remains singularly little to support the Freudian position in the form in which it is usually presented to us by its advocates. In my experience this is particularly true in regard to the part played by sexual experience in the production of the functional disorders arising out of the war. We now have abundant evidence that those forms of paralysis and contracture, phobia and obsession, which are regarded by Freud and his disciples as pre-eminently the result of repressed sexual tendencies occur freely in persons whose sexual life seems to be wholly normal and commonplace, who seem to have been singularly free from those sexual repressions which are so frequent in modern civilisation, especially among the more leisured classes of the community. It is, of course, obvious that the evidence in this direction, being negative, cannot be conclusive. The point is that while we have over and over again abundant evidence that pathological nervous and mental states are due, it would seem directly, to the shocks and strains of warfare, there is, in my experience, singularly little evidence to show that, even indirectly and as a subsidiary factor, any part has been been taken in the process of causation by conflicts arising out of the activity of repressed sexual complexes. Certainly, if results are any guide, the morbid states disappear without any such complexes having been brought to the surface, while in other cases the morbid states persist in spite of the discovery of definite complexes, sexual or otherwise, going back to times long before the war.

The denial of the validity of Freud's theory of the unconscious in the form currently held by its adherents, as the means of explaining nervous and mental disorders, is, however, something very different from the denial of the validity of this theory altogether. While in my experience instances of the kind which abound in the Freudian literature are rarely met with among the cases arising out of the war, there is hardly a case which this theory does not help us the

better to understand—not a day of clinical experience in which Freud's theory may not be of direct practical use in diagnosis and treatment. The terrifying dreams, the sudden gusts of depression or restlessness, the cases of altered personality amounting often to definite fugues, which are among the most characteristic results of the present war, receive by far their most natural explanation as the result of war experience, which by some pathological process, often assisted later by conscious activity on the part of the patient, has been either dissociated or is in process of undergoing changes which will lead sooner or later to this result. While the results of warfare provide little evidence in favour of the production of functional nervous disorders by the activity of repressed sexual complexes, I believe that they will be found to provide abundant evidence in favour of the validity of Freud's theory of forgetting, which in the earlier part of this paper I have regarded as the most striking and characteristic feature of his psychology.

Line of Treatment to be Adopted.

I do not attempt to deal generally with the practical consequences which must follow, if we accept the view that many of the symptoms which follow the shocks and strains of warfare depend on the repression of painful experience. I am content now to point out one consequence if we accept the position that certain symptoms of war-strain depend on the activity of repressed experiences arising directly out of the war. I believe that I am stating the orthodox view of the medical profession, I am certainly expressing that of the man in the street, if I say that the forgetting of unpleasant experience is held to be the obvious and natural line of procedure. The advice given takes such forms as: "Put it out of your mind," "Try not to think of it." Moreover, if the advice is not successful and the solitude of the night allows the painful thoughts to force themselves on the attention of the patient, hypnotic drugs, hypnoidal suggestion, or perhaps even definite hypnotism are employed to assist the process of driving the painful thoughts below the threshold of consciousness. When hypnotism or hypnoidal suggestion is employed, there is definite danger of producing directly just those states of dissociation which it should be our most vital duty to avoid, while it is a moot question whether the employment of hypnotic drugs does not tend to produce the same effect though in a different and more gradual way.

If the view I have put forward has any validity the proper line of conduct should be the direct opposite of that which is usually taken. Instead of advising repression and assisting it by drugs, suggestion, or hypnotism, we should lead the patient resolutely to face the situation provided by his painful experience. We should point out to him that such experience as that of which he has been the subject can never be thrust wholly out of his life, though it may be possible to put it out of sight and cover it up so that it may seem to have been forgotten. His experience should be talked over in all its bearings. Its good side should be emphasised, for it is characteristic of the painful experience of warfare that it usually has a good or even a noble side, which in his condition of misery the patient does not see at all, or greatly underestimates. By such conversation an emotional experience, which is perhaps tending to become dissociated, may be intellectualised and brought into harmony with the rest of the mental life, or in more technical language, integrated with the normal personality of the sufferer. As a matter of practical experience the relief afforded to a patient by the process of talking over his painful experience, and by the discussion how he can readjust his life to the new conditions, usually gives immediate relief and may be followed by great improvement or even rapid disappearance of his chief symptoms. It is in grave cases in which the painful experience of warfare has come to persons of somewhat neuropathic tendency, liable to the occurrence of dissociation, that this line of treatment is especially useful, but in slighter cases and more normal subjects there is much to be said for encouraging the patient to become familiar with his painful experience instead of treating it by the process of taboo, surrounding it, and assisting the tendency of the patient to surround it, with a halo of mystery. What is rather needed is the encouragement of that kind of familiarity which breeds indifference, if not contempt.

Value of Freud's Theory to Medicine.

I have only dealt superficially with some of the misunderstanding in which Freud's theory of the unconscious has been enveloped, especially in this country, while I considering the place which this theory seems de to take in relation to the vast mass of clinical expe which modern warfare is providing. I must conclu considering in the most general manner what I hold to b value of Freud's theory to medicine. Freud's theory of unconscious should appeal to the physician in that it provides him with a definite working scheme of influences, which he has long known to be active in the causation of mental disorders and of the bodily disorders which are traceable to mental factors. The modern conception of such disorders is that they are not merely the result of some shock or strain, but are the outcome of the whole life-history of those who suffer, that they are the result of the totality of the individual experience of the patient as well as of that ancestral experience which we call heredity. ' Of this ancestral experience and to a large extent of the individual experience, everyone will acknowledge that it is not accessible to the manifest consciousness of the patient and cannot be learnt from him by the ordinary methods of obtaining the history of the patient and his illness. The great merit of Freud is that he has provided us with a theory of the mechanism by which this experience, not readily and directly accessible to consciousness, produces its effects, while he and his followers have devised clinical methods by which these hidden factors in the causation of disease may be brought to light. For the physician who is not content to walk in the old ruts when in the presence of the greatest afflictions which can befall mankind, Freud has provided a working scheme of diagnosis and therapeutics to aid him in his attempts to discover the causes of mental disorder and to find means by which it may be remedied. My own standpoint is that Freud's psychology of the unconscious provides a consistent working hypothesis to aid us in our attempts to discover the rôle of unconscious experience in the production of disease. To me it is only such an hypothesis, designed like all hypotheses, to stimulate inquiry and help us in our practice while we are groping our way towards the truth concerning the nature of mental disorder. We can be confident that the scheme as it stands before us now is only the partial truth and will suffer many modifications with further research, but that it takes us some way in the direction of the truth seems to me certain. If this value of Freud's theory were only a probability, or even only a possibility, are we justified in ignoring it as an instrument for the better understanding of disorders of which at present we know so little? Are we to reject a helping hand with contumely because it sometimes leads us to discover unpleasant aspects of human nature and because it comes from Vienna?

SALVARSAN AND INTRAMINE, WITH REFLECTIONS UPON CHEMO-THERAPY.

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IN my Hunterian lectures last year[1] I advanced the theory that the arsenic in salvarsan did not attack the parasites directly, but only indirectly by increasing the oxidising action of the protein particles in the serum and in the plasma cells. I also suggested that metals in general acted as oxidising agents, and that non-metals acted as reducing agents. As we had no powerful reducing drug analogous to salvarsan, I introduced a sulphur compound, and intramine, the name by which this sulphur compound goes, completed the chemo-therapeutic programme. I also showed to the best of my ability that the reason why chemo-therapeutic agents were more potent in protozoal diseases, and especially in syphilis, was due to the increased size and number of the protein particles, which circulate in the serum, forming the resisting substance of the host, or, as it is commonly called, the antibody. If it was proved that arsenic was not essential, it would be right to supplant it by another and less toxic metal.

In certain quarters what may be called the intensive arsenical treatment is now in vogue. Several injections up to 11 or more of the arsenical substitutes for salvarsan are prescribed and followed by an equal number of injections of mercury. The efficiency of such a treatment is judged by the negative

[1] THE LANCET, May 13th (p. 981) and 20th (p. 1025), 1916.

Wassermann reaction which is obtained at the end of it. As the Wassermann reaction is a purely physical reaction (surface-tension), depending upon the number and size of the protein particles in the serum; and as the administration of colloids, if continued long enough, sends many of these particles into solution, thereby making the reaction negative; and as the action of colloids is not a direct one on the parasites, it can readily be seen that a negative Wassermann reaction can give no indication as to whether any parasites are left behind or not. What light does clinical knowledge throw on the subject? Cases treated in this way may develop cerebro-spinal syphilis within two months of the cessation of treatment, and they are, to my own knowledge, gained in hospital and private practice, not few. Other cases may develop severe systemic syphilitic recurrences within the year. In both these classes of cases symptoms of the recurrence are present for some weeks before the Wassermann reaction becomes positive. In many of the cases which present no clinical manifestations the Wassermann reaction becomes positive within a year. Therefore the intensive arsenical treatment does not cure syphilis, and it may leave the patient in a worse condition than he was in at first.

I will now cite three cases out of the large number which have come under my eye, to illustrate what has just been said.

CASE 1.—In August, 1914, a patient had a single primary sore on the prepuce. He was treated with five intravenous injections of galyl, and with intramuscular injections of mercury for six months. In April, 1916, a pseudo-chancre appeared on the prepuce, close to where the original sore had been. The patient then had 11 intravenous injections of kharsivan, and 12 intramuscular injections of mercury. The sore just healed as the eleventh injection of kharsivan was given. In January, 1917, two pseudo-chancres appeared on the skin of the penis. I injected collosol iodine intravenously, and 5·0 c.c. of intramine intramuscularly, with the result that in a week's time the sores had completely healed and the induration accompanying them had disappeared.

CASE 2.—A patient came for treatment when the rash had only just entered the macular stage. He received nine intravenous injections of galyl, and three courses of mercurial injections. Before finishing the third course a large gumma appeared on the back and another on the abdomen. The Wassermann reaction was negative, as it usually is in such cases. Five more injections of galyl were prescribed, without any effect whatever; within ten days, after one injection of intramine, both gummata had completely healed, and the patient felt better than he had done for months.

CASE 3.—The patient, a man, aged 32, had a primary sore on the prepuce and had just entered the generalisation stage when treatment was commenced in June, 1916. The treatment consisted of 11 intravenous injections of kharsivan and seven intramuscular injections of mercury, which ended in August, 1916. Two months later the patient developed bad headaches and unsteadiness of gait. He soon became deaf in the left ear and had double vision. The pupils were unequal, the bilateral discs were choked, and there was paresis of the left auditory and oculo-motor nerves—due to basilar meningitis. The reflexes of the upper extremities were exaggerated; in the lower extremities they were unequal and diminished. Romberg's sign was present, the patient had pains down one leg, and had lost all sexual desire—due to a meningo-myelitis. An examination of the cerebro-spinal fluid revealed the following: Pressure raised; positive lymphocytosis, 650 cells per c.mm.; albumin and globulin increased; Wassermann reaction positive. From October, 1916, until the above examination was made, in January, 1917, the Wassermann reaction of the blood was negative (tested three times). Under colloidal iodine, colloidal mercury, and intramine injected intravenously and intraspinally (prepared serum) the patient recovered.

From the foregoing three cases, which are illustrative of many others, the following statements may be made. If the patient is in the primary stage and treated with oxidising agents only, should a recurrence appear it is most likely to simulate a chancre. If the patient has entered the generalisation stage then the recurrence, if systemic, will be a gumma, and if nervous it will be one of cerebro-spinal meningitis. These three cases show that the parasites are not attacked by the drugs directly; that the continued use of oxidising agents is injurious to the patient, as evidenced by the rapidity with which symptoms disappear when a reducing agent like intramine is prescribed; and that arsenic should be eliminated as far as possible from the treatment, as evidenced by the damage it exerts upon nerve and vascular tissue.

The processes of oxidation and reduction *in corpore* are regulated by iron and sulphur respectively, and as sulphur in the form of intramine has proved so successful, not only in hastening the disappearance of the syphilitic lesions, but also in reducing the number of the arsenical injections by half, I have attempted to prepare an iron compound analogous to it, which would supplant arsenic altogether, but up to now not with complete success.

Bearing in mind that the activity of a metal is largely dependent upon its atomic weight, and that mercury has been used for so many years in the treatment of syphilis, without producing worse toxic symptoms than stomatitis, gingivitis, and diarrhœa, it occurred to me that used in a colloidal state better therapeutic results would be obtained than were possible with arsenical compounds. It was a question as to whether the advantage given by the higher atomic weight of the mercury would more or less balance the advantage given by the amino groups in the arsenical compounds. Complex amino compounds of mercury are too toxic. Practical experience soon showed that the syphilitic symptoms disappear very much quicker under colloidal mercury than under salvarsan; roughly speaking, I should say that a full dose of colloidal mercury is more powerful than three full doses of salvarsan. The colloidal mercury, as it is now prepared at the Crookes' laboratories, is supplied as a 1 per cent. emulsion, ready for injecting. The dose is from 5·0 to 15·0 c.c., and the drug can be injected intravenously to out-patients without causing more than a little abdominal pain, diarrhœa, and tender gums, which usually disappear within 24 hours, or immediately after an intravenous injection of intramine. The tenderness of the gums begins to vanish while the patient is on the table.

When I first used colloidal mercury I employed too big doses and nearly had some fatal results, but fortunately the incidents proved instructive.

CASE 4.—The patient had a primary sore on the skin of the penis, general adenitis, and was more or less covered with a follicular syphilitic eruption. I injected intravenously 10·0 c.c. of a 5 per cent. emulsion of colloidal mercury. In the quantity injected there was 0·5 gramme of collo dal mercury, the action of which would be very much greater than 0·5 gramme of ordinary mercury. On the following day the patient had severe abdominal pain and diarrhœa. The diarrhœa increased, and blood was passed per rectum. This continued for a week, during which time not a drop of urine was passed. On the second day severe stomatitis set in, which became gangrenous a few days later. The patient also had hæmorrhagic conjunctivitis, herpes oris, looked and was desperately ill, and I had fears that he might die. This was a typical case of acute mercurial poisoning, and the mercury was acting as a poison in virtue of its oxidising power. This being the case, it struck me that the administration of an equally powerful reducing agent might cure the condition. I injected 100·0 c.c. of colloidal iodine intravenously, and 5·0 c.c. of intramine intramuscularly. Within 48 hours the diarrhœa ceased, and the patient passed nearly his full amount of urine. The condition improved so much from day to day that, with no other treatment whatever, he was perfectly well 18 days later, when there was no albumin in the urine and every syphilitic symptom had vanished.

Another patient received 10·0 c.c. of the same preparation intravenously the same day, having already had 10 0 c.c. injected intramuscularly three days previously. Therefore the patient had 1·0 gramme of colloidal mercury in his system. This patient had exactly the same symptoms as above described, and recovered in the same rapid way after an intravenous injection of colloidal iodine, and an intramuscular injection of intramine. I have had three other cases in which the symptoms were not so marked, smaller doses having been prescribed, which improved at once with one injection of intramine, In all these five cases the syphilitic manifestations disappeared in a few days, and some of the lesions were such as would not have vanished with six or more injections of salvarsan. The urine in these cases has been tested several times since, and has always been free from albumin.

Having obtained such accidental success with intramine in cases of mercurialism, I wondered whether the symptoms of arsenical intoxication would disappear as rapidly after its use. The following interesting case will show that intramine is also a specific for arsenical poisoning.

CASE 5.—A woman suffering from cerebro-spinal syphilis had six injections of galyl, three intraspinal injections, and then she took mercury internally for nine months. The last galyl injection produced an arsenical dermatitis which, in spite of treatment, persisted for nine months, when the cerebro-spinal symptoms reappeared. Within three days after an intravenous injection of colloidal iodine and an intramuscular injection of intramine the dermatitis had practically vanished.

These cases of metallic poisoning being remedied by a non-metallic drug like intramine, not only supports my theory of oxidation and reduction, but also explains why iodine should be useful in cases of plumbism. Doubtless intramine in cases of lead poisoning would be more valuable still. The reader will probably have noticed that whenever an injection of intramine has been prescribed it has been preceded by an injection of colloidal iodine. This is done because iodine is readily taken up by the mercaptan group, which is formed on the breaking down of the intramine molecule, thereby preventing the mercaptan group from exhibiting its affinity for oxygen, which, if allowed to do so, would diminish the effect of the intramine.

Realising the close similarity between arsenical dermatitis and other chronic eczematous skin eruptions, it struck me that the inflammation in some of the latter cases might be due to poisons having too powerful an oxidising or too powerful a reducing action. The following case will show the truth of such a contention.

CASE 6.—A woman consulted me for a chronic dermatitis of the arms and legs, which had persisted for five years and had yielded neither to ointments nor to X rays, &c. As the eruption was patchy and had persisted for so long, I thought the diagnosis of mycosis fungoides was possible. The patient also suffered from asthma, which I have noticed not infrequently accompanies chronic dermatitis, and as I believe this kind of asthma is due to an upset of the normal hydrogen ion concentration of the serum, hence affecting the oxidase-reducase system as well, I thought it possible that treatment along the lines indicated would prove successful. I gave large doses of strychnine, iron, and arsenic internally for three weeks, then an intravenous injection of colloidal iodine and an intramuscular injection of intramine, continuing the iodine treatment internally for three weeks more. The result was that the dermatitis vanished and the asthma disappeared also.

Being strongly of the opinion that intramine, colloidal mercury, and salvarsan, do not kill the parasites directly, but only increase the action of the oxidase-reducase system of the protein particles in the serum, it struck me that their combined use in any chronic infection would be useful. Naturally so good a result would not be expected in a chronic bacterial infection as could be obtained in syphilis, since in the former there are not so many protein colloidal particles in the serum, and it stands to reason that a direct ratio must exist between the beneficial therapeutic result obtainable and the number of particles present to be acted upon.

The following case of ulcus molle serpiginosum shows what a wonderful effect can be produced by the administration of powerful reducing agents.

CASE 7.—The patient had a soft sore in 1900. Five weeks after the sore had healed a bubo appeared in the right groin, burst, then healed up, to break down again a few weeks later and form ulcers, which spread up over the abdomen and down the right leg to below the knee-joint. The ulceration was still spreading in spite of various methods of treatment which had been employed, when the patient consulted me. Within 14 days after an intramuscular injection of intramine, 10·0 c.c., preceded by an intravenous injection of colloidal iodine 100 0 c.c., the ulceration, which had progressed without ceasing for 17 years, had completely healed.

I treated another case of ulcus molle serpiginosum, but with much smaller doses, as the patient was a nervous individual, and not nearly such a good result was obtained. I have since learned that, especially in chronic bacterial infections, such as gonorrhœal arthritis, &c., and in syphilis, the best results are to be obtained by using maximum doses of a few injections, and to allow as short a time as possible to intervene between the administration of any two of them. Satisfactory results cannot be obtained by commencing with small and continuing with gradually increasing doses. Before I found the correct dose of colloidal mercury I sometimes injected intramine intramuscularly on the same occasion as the mercury was injected intravenously, as the toxic symptoms caused by the latter were considerably diminished thereby. Theoretically, it was impossible to foretell whether the simultaneous administration of an oxidising and a reducing agent would be more efficacious or less so than allowing an interval to elapse between them. The following case will show that equally satisfactory results may be obtained by prescribing intramine and colloidal mercury together. This case had to be treated in the way prescribed as the patient would not have an intravenous injection, and it was imperative to rid him of his symptoms as quickly as possible.

CASE 8.—The patient had a hard sore on the right side of the glans penis and corona, an infiltrated papular rash, mucous papules in the mouth and between the toes, and very bad headaches. In this condition he had 10·0 c.c. of colloidal mercury (5 per cent.) injected into one buttock and 5·0 c.c. of intramine into the other buttock. The headaches passed away within 24 hours, the rash within eight days, and the sore with its induration had completely disappeared ten days later. The stomatitis, diarrhœa, &c., set up by the mercury was much less than the same dose had produced in other patients who had not had a simultaneous injection of intramine.

Owing to the pain caused by the intramuscular administration of colloids I have been attempting for some time past to prepare intramine suitable for intravenous use and have at last succeeded. The success has been largely due to the help given by my friend Mr. J. Ward, to whom I wish to express my thanks. Intravenous intramine is put up as a 0·1 per cent. emulsion, and the dose ranges from 20·0–100·0 c.c. Intramine injected intravenously causes no unpleasant sequelæ, with the exception of an attack of coughing just as the injection is finished.[2] Out-patients may be treated with it, and it does not cause venous thrombosis. The effect on the well-being of the patient by injecting intramine intravenously the day after colloidal mercury has been injected is astounding. While finding the correct dose for human beings, on two occasions I gave an overdose. Both patients received 20·0 c.c. of a 1 per cent. emulsion, with the result that they became very ill. They ran a high temperature, sweated profusely, complained of violent headaches, and had vomiting and diarrhœa. One of the patients had excruciating neuritis over the deltoid region of the right arm. Guided by the experience I had had with intramine curing mercurialism, on the third day, as the symptoms had not abated, I injected colloidal mercury intravenously, with the result that on the same day as the oxidising agent was injected the patients' condition became normal.

From this short article I think it is clear that the inclusion of arsenic in our chemo-therapeutic armamentarium is not necessary; that the combined use of oxidising and reducing agents is better than the employment of only oxidising or of only reducing agents; that the treatment of syphilis, so far as it affects the soldier's stay in hospital, can be very considerably diminished in duration; and that the severe after-effects, such as the increase in nervous syphilis, which will become more and more apparent, can be to a large extent avoided. Nine intravenous injections may be given in a fortnight, in which period practically any syphilitic symptom may be made to disappear.

This work also shows that, broadly speaking, our treatment of all diseases is the same, and that the therapeutic results are only more striking in protozoal diseases, especially in syphilis, owing to the peculiar physical properties of the colloidal protein particles in the serum of these diseases, which allow for a greater play of the processes of oxidation and reduction.

The treatment of diseases by drugs can never be perfect, since although the host attacks the poison or parasite by means of oxidation and reduction—a surface action—this oxidation and reduction is nevertheless regulated by the substratum to which the ions, which do the work on the surface, are attached. For treatment to be perfect we shall have to find out the chemico-physical nature of the various substrata, since specificity seems to depend upon the difference between them, and then to manufacture or synthesise them in the laboratory. At present drugs regulate the surface action, and vaccines, &c., the action of the substratum, but, unfortunately, the latter are not yet powerful enough to be curative.

Wimpole-street, W.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

Tropical Diseases in the Balkanic Zone.

A MEETING of this section was held on June 12th, Sir RICKMAN GODLEE being in the chair.

Major ALDO CASTELLANI delivered a lecture on Tropical Diseases Found in the Balkanic Zone. That most frequently met with was malaria, the protean nature of which, though formerly well known, had been again brought into prominence. Pernicious cases were common in the late spring, summer, and autumn. The symptoms might simulate many other diseases and a wrong diagnosis might easily be made, with very serious results. Cases with symptoms pointing to lesions of the central nervous system were far from being rare, and he had met with the following types: (1) comatose, (2) delirious, (3) cerebro-spinal meningitic, (4) hemiplegic or monoplegic, (5) bulbar, (6) cerebellar, (7) tetanic, (8) eclamptic, (9) aphasic, (10) amaurotic, (11) spinal. The classical varieties of malaria, as described in the books, were not frequent. A purpuric and hæmorrhagic form had occurred resembling scurvy. It was marked by petechiæ and hæmatomata, spongy and bleeding gums,

[2] The fit of coughing may be avoided by neutralising the emulsion with sodium hydrate just before it is injected.

and sometimes bleeding from mucous membranes. The spleen, however, was enlarged, and although parasites were found in only about 10 per cent. of the cases, the cases reacted to treatment by quinine. Another blood condition which might be closely imitated was pernicious anæmia. The patient was generally a young man or woman with the typical pallor and lemon-yellow tint of pernicious anæmia; in some cases the liver was enlarged, or, more rarely, the spleen; there was either no fever or very little. The blood might be negative for malaria on repeated examination and show most of the common features of pernicious anæmia, including a high colour index. In elderly people the profound anæmia might give rise to the suspicion of internal cancer. The lecturer had come across cases of malaria simulating other specific infectious diseases. The typhoid type was far from rare; the patient looked like a case of typhoid and the temperature was typhoid-like, whilst the spleen was large but not hard. Bacteriological examinations for typhoid and paratyphoid infections, however, were negative, whilst the blood was full of malaria parasites which in this type of case were very little influenced by quinine. He had seen cases of pseudo-cholera and pseudo-dysentery of malarial origin and also of pseudo-tetanus due to the same cause. Several diseases of the digestive system might be simulated by malaria—e.g., appendicitis and cholecystitis. Malaria might affect the respiratory and circulatory systems. He had seen several cases of dry bronchitis of malarial origin and one case of pneumonia-like consolidation with bloody expectoration, and also 3 cases of typical angina pectoris all cured by the administration of quinine. Heart-block, of which he had seen one case, and tachycardia and cardiac arrhythmia might be malarial. He had met with cases of peripheral arteritis due to the same cause and also neuritic cases resembling beri-beri and others of local œdema.

As regards the diagnosis of the malady in the Balkans, he suggested the following rules: 1. Whatever the symptoms of the case, one should always keep in mind the possibility of malaria. 2. A negative blood examination is of no importance whatever unless the examination is repeated many times and at various intervals. 3. If quinine does not influence the fever, this does not always exclude malaria. 4. While giving very great importance to laboratory methods—for it is only by this means that a positive diagnosis can be made with certainty—do not neglect the clinical examination of patients. Train your senses as much as possible. The importance of simple inspection and of simple palpation can hardly be exaggerated. A slight abnormality of the colour and pigmentation of the skin, easily overlooked by the inexperienced, may suggest a diagnosis of probability in an obscure case, and acting on it may perhaps save the patient's life.

For treatment of the disease in the Balkans, quinine was by far the most important drug; it should always be given in very large doses, at least gr. 30 to 60 daily, by the mouth in ordinary cases, by intramuscular injection in severe cases, intravenously in the pernicious forms. It must be admitted, however, that there were cases which responded very slowly to a simple quinine treatment. In them other drugs had been tried, such as arsenical preparations, antimony, and picric acid. When given alone none of these had much effect, but when used as adjuvants to quinine, some of them (arsenic, for instance) seemed to increase its beneficial action. A treatment which had given him good results in certain cases was a combination of quinine, phosphorus, and tartar emetic. The prognosis was good in the enormous majority of cases if efficiently treated; but it must be remembered that in pernicious cases a high mortality might occur despite energetic treatment, and that in a large number of cases, even of the benign form, the cure was merely clinical, complete sterilisation not having been achieved. The affection lay dormant for months and years, and any cause lowering resistance, such as chill or traumatism, might cause the acute symptoms to reappear.

Next to malaria, the diarrhœas and dysenteries were the most common affections. The majority of cases of dysentery were of bacterial origin, but numerous cases of the amœbic type also occurred. Cases of enteritis due to flagellates and, much more rarely, to ciliates occurred. Coccidiosis had been observed. Cholera and paracholera had been rare. Attention should be called to the choleraic type of bacterial dysentery; also to a peculiar type of diarrhœa seen in Serbian soldiers who had suffered terribly from starvation during the Albanian retreat, which closely resembled the famine diarrhœa observed in India.

Camp jaundice was common. Two varieties might be distinguished: (1) a very severe type with high fever, lasting 10 to 12 days, and showing occasional relapses—true Weil's disease—which was rare; (2) a mild type, often afebrile and very common. Weil's disease was, of course, of spirochætic origin, but in his opinion it was probable that many cases of the mild type were also spirochætic. In addition to true camp jaundice there were also cases of jaundice due to malaria, due to paratyphoid, and due to streptococci; nor should the icteric type of relapsing fever be forgotten. Enteric fevers were fairly frequent in the Balkans, but recently had not taken any epidemic form. In certain districts paratyphoid A and B were more frequently met with than true typhoid. Similar fever due to various intra-intestinal germs were not rare. Cases had been found due to *B. colombensis*. Attention should be paid to the not rare association of mixed infections of the typhoid and paratyphoid organisms. He had seen two cases in which there was infection by all three. Malta fever was not common. He had only seen two cases in Macedonia, and the kala-azar of adults he had never seen in the Balkans, though he had met with many cases of the infantile type in certain islands of the Adriatic and Ægean seas. Relapsing fever was quite common. In its treatment he had obtained the best results by a combination of salvarsan, neosalvarsan, or galyl, with tartar emetic. Typhus exanthematicus was, at the present moment, very rare, although a terrible epidemic raged in 1914 and 1915. Trench fever was occasionally met with. Both of the types described in France had been recognised in the Balkans. Pappataci's fever was extremely common in certain parts of the Balkans, especially in the late summer and early part of the autumn. It was often erroneously diagnosed as dengue, though a few cases of the latter had probably occurred. A distinguishing feature of Pappataci's fever was the flushing of the face, which had often the appearance of being slightly bloated. This flushing sometimes amounted to an erythematous rash, which also involved the neck. It was very persistent and lasted long after the fever was over. The mucosa of the soft palate presented a peculiar appearance, numerous small hyperæmic roundish spots, sharply limited by a line of demarcation between the hard and soft palate, being visible, which also persisted after the temperature had dropped. Leucopenia served to distinguish it from incipient typhus. Broncho-mycosis and broncho-spirochætosis were observed. Pellagra was quite common in several districts of Macedonia, but he did not think there was any danger for our troops. Of the tropical diseases which were of rarer occurrence he mentioned filariasis, sprue, intestinal myiasis, mycotic, spirochætic, and flagellitic urethritis.

Certain tropical skin diseases were frequently met with. The following were a cause of great discomfort in summer, and were often wrongly diagnosed: Dermatitis interdigitalis, epidermophytis or "mango toe," tinea cruris or "dhobie itch," prickly heat, various types of tropical pyosis, such as pyosis Mansoni, pyosis discoides, &c. He had seen in 1915 in Macedonian peasants cases of ulcus tropicum, oriental sore, ulcus infantum, blastomycosis, sporotrichosis, accladiosis, &c., and also numerous cases of trichomycosis axillaris flava, nigra and rubra, of intertrigo saccharomycetica, and various other hyphomycetic affections. He had also observed two cases of Madura foot, two of keratoma plantare sulcatum, and one of ainhum.

ULSTER MEDICAL SOCIETY.—At a meeting of this society held on May 31st the following office-bearers were elected for session 1917-18:—President, Dr. W. D. Donnan; Vice-Presidents, Dr. R. Leathem and Dr. W. S. Smyth (Antrim); Council, Dr. A. G. Robb, Mr. P. T. Crymble, Mr. R. J. Johnstone, Dr. F. Symth, Dr. G. A. Hicks, and Mr. H. A. J. S. Murphy; secretary, Mr. S. T. Irwin; treasurer, Dr. V. Fielden; librarian, Dr. W. L. Storey; editorial secretary, Dr. C. G. Lowry.

Dr. L. A. Tarassevitch's "Medical Bacteriology," which we reviewed in THE LANCET of June 2nd, is issued by the Publishing House Collaborator (Russ. *Sotroudnik*), of Petrograd and Kieff, who are being asked to send some copies of the book to England.

Reviews and Notices of Books.

Le Traitement des Plaies Infectées. By A. CARREL and G. DEHELLY. Précis de Médecine et de Chirurgie de Guerre. With 78 figures and 4 plates. Paris: Masson et Cie. 1917. Pp. 180. Price 4 frs.

The Treatment of Infected Wounds. By A. CARREL and G. DEHELLY. Translation by HERBERT CHILD, Captain, R.A.M.C. (T.V.). With Introduction by Sir ANTHONY A. BOWLBY. London: Baillière, Tindall, and Cox. 1917. Pp. 238. Price 5*s.* net.

AT the present time the Carrel-Dakin method is in frequent use in our army for the treatment of wounds. Simplicity is its great merit, and the method has proved of extreme value in many cases, although the difficulty of keeping the patient dry is a not inconsiderable drawback. Exigencies of circumstances in a particular case or difficulty of travelling, moreover, may cause imperfections in the technique with corresponding delay in the healing, while it is obvious that a vertical cup-shaped wound, with a fair-sized mouth and no leaking places at the bottom or sides, is likely to respond most quickly to the treatment. A large part of the book is taken up with information as to laboratory procedure, while at the same time it does not contain the amount of clinical information which might have been expected considering the important claims made on behalf of the treatment. The technique is, however, very fully described, and the pictures themselves give a good idea of the results that may be expected from this medical sterilisation of wounds. We recommend the book to all our readers.

Captain Child's translation, the early appearance of which shows commendable enterprise on the part of the publishers, is well done and makes Carrel's work accessible to the English reader. Sir Anthony Bowlby expresses in his introductory note the appreciation of British surgeons at the front of the value of Carrel's method. Whenever it has been thoroughly carried out it has, he states, accomplished all that has been claimed by its author and has benefited thousands of patients. He strikes a note of warning in regard to attempts to improve on Carrel's method, holding that modifications should not be introduced until the original method has had a proper trial. The translation will ensure the method a proper trial in this country.

Treatment of Joint and Muscle Injuries. By W. ROWLEY BRISTOW, F.R.C.S. London: Henry Frowde and Hodder and Stoughton. 1917. Pp. 148. Price 6*s.* net.

WITH the object of advocating his own method of treatment for muscular disability by means of graduated contraction of muscles, using for the purpose a faradic coil specially designed to give painless stimulation, the author gives a general account of the treatment of fractures, as well as of joint and muscle injuries. He contends that the essential factor in these conditions is the treatment of the muscles themselves, whether affected by direct injury or by reflex atrophy; that restoration of function is more speedily obtained by his method of electrical stimulation than by the more usual treatment with massage, which he describes as very tedious and very slow in producing a good result; and active exercises against graduated resistance, which are of little service when atrophy is well marked. War surgery has given an impetus to the electrical treatment of peripheral injuries, and the author's method appears to be an attempt to use rationally means hitherto employed casually and without conviction as to any resulting good. An important chapter is devoted to the treatment of peripheral nerve injuries.

JOURNALS.

The American Review of Tuberculosis. Vol. I., No. 1. March, 1917. Published monthly at 2419–21, Greenmount-avenue, Baltimore, Md., by the National Association for the Study and Prevention of Tuberculosis. Price $2 per volume to members, $3 to non-members. Single copies 35 cents.—The aims of this new journal are explained in a brief preface by the managing editor, Dr. Allen K. Krause (Baltimore), to be: to offer all who are interested in tuberculosis a medium in which to present their work and through which to develop their views; to stimulate productiveness and to interest those not directly concerned with tuberculosis but working in related fields. The editor-in-chief is Dr. Edward R. Baldwin, of Saranac Lake, who is assisted by an editorial staff of six—Lawrason Brown (Saranac Lake, N.Y.), H. R. M. Landis and Paul A. Lewis (Philadelphia, Pa.), M. J. Rosenau (Boston, Mass.), Henry Servall (Denver, Col.), and Borden S. Veeder (St. Louis, Mo.), while many well-known names occur in the list of associate editors. Of the first number, 50 pages are devoted to three original papers dealing respectively with classification, chronic non-tuberculous lung infection, and serological studies; 15 pages follow of abstracts from current medical literature. The last decade has seen a great revival of interest in America for research work in tuberculosis, witness the Phipps foundation at Philadelphia, the Trudeau foundation at Saranac Lake, and the Dows foundation at Johns Hopkins Hospital. The new journal is the result of this revival, and should be an important aid in focussing attention on research, whether clinical, pathological, or social, in the field of tuberculous disease. It is attractively bound and printed. We wish the venture every success.

Veterinary Review. Edited by O. CHARNOCK BRADLEY, M.D., D.Sc.Edin., M.R.C.V.S., Principal of the Royal (Dick) Veterinary College, Edinburgh. Published quarterly. London and Edinburgh: W. Green and Son, Limited. 10*s.* 6*d.* per annum.—This quarterly periodical is intended as a summary of current work of interest and value to the veterinarian, whether his sphere of life lies in the laboratory or the domain of the clinician, and in this issue the editor takes his readers over the best publications in medicine (human and veterinary) and agriculture in Great Britain, and also culls discriminatingly from those of America. Commencing with abstracts from anatomical and clinical sources, Dr. Bradley summarises the latest researches in surgery, pathology, toxicology, and therapeutics. Thirty pages are devoted to notes on books and general bibliography, and the ground covered is very large, showing how many spheres of work, other than those which are purely veterinary, can be turned to good account for the benefit of the suffering animal. Those who make a study of the comparative side of nature should see this quarterly periodical regularly.

Abstracts of Bacteriology. Under the editorial direction of the Society of American Bacteriologists. Editor: A. PARKER HITCHENS. Vol. I., No. 1. Cambridge University Press and Williams and Wilkins, Baltimore. February, 1917.—The Society of American Bacteriologists has already earned the gratitude of workers in bacteriology, especially as an applied science, by standardising various methods and materials. A year ago the society began to publish an official journal, and it has now decided to produce a bi-monthly number of Abstracts of Bacteriology, the first of which has just been issued. The two journals bear to one another a somewhat similar relation to that which exists between the *Annales de l'Institut Pasteur* and the *Bulletin*. The vast increase in the volume of original publications on bacteriological subjects, in which America has taken an almost preponderating share, has rendered works of this character not only useful but necessary. The abstracts in the present number are confined to American bacteriological literature, but even so they fill some 70 pages, and the list of journals, admittedly incomplete, with which it is proposed to deal in the future number over a thousand. Bacteriology has so many relations with medicine, agriculture, and industry that its literature appeals to a wide circle of readers who are not necessarily interested in it as a pure science. To such readers works like the present are especially useful; they furnish a guide to multitudinous publications, though all abstracts, however good, must be used with caution, and cannot be regarded with safety as doing more than indicate the kind of information which may be found in the original papers. Except that the present publication contains the Proceedings of the Society, it differs little in method and arrangement from other periodicals of like character published in various countries, though the arrangement of the papers concerned with human pathology is a little unusual, since they are grouped not according to the micro-organism concerned but according to the system—gastric, respiratory, or circulatory—in which the organism may happen to cause disease. The journal is produced with the luxury of paper, type, and margin which we associate with American scientific publications, and is assured of a hearty welcome.

THE LANCET.

LONDON: SATURDAY, JUNE 16, 1917.

The Readjustment of Civilian and Military Medical Needs.

THE position of medical officers forming the *à la suite* staffs of the Territorial general hospitals, a large proportion of whom have high professional position as consultants in various branches of medicine and surgery, appears to us to require consideration in the circumstances that have been brought about by the long duration of the war and by the enormous size of our present armies. It was very generally assumed under the original scheme by which the Territorial general hospitals were staffed that the medical officers would, at any rate in large proportion, remain in touch with civilian practice; but, as a matter of fact, many of these officers have now taken service abroad either under the Imperial obligation of their commissions or in obedience to the patriotic call for active assistance which they considered could best be answered by proceeding to one of the scenes of action. The loss of these *à la suite* medical officers to civil practice in their areas was not at first considered sufficiently closely as a matter that might become nationally serious, but we can now all see that it has become a very serious affair, and that as the needs of the War Office make ever-recurring drafts upon the medical personnel of the country, a point will soon be reached at which common prudence will demand a close consideration and, if necessary, a revision of the position.

The Central Medical War Committee, whose personnel has been strengthened by the addition of the names of Dr. H. J. CAMPBELL (Bradford), Dr. H. J. CARDALE (Cubitt Town), Lieut.-Col. J. MICHELL CLARKE (Bristol), Dr. T. W. H. GARSTANG (Altrincham), Dr. ARNOLD LYNDON (Hindhead), and Dr. H. J. STARLING (Norwich), has had under consideration the difficulties that the liability to sudden removal of medical men engaged in civilian practice may cause in localities where the existing civilian doctors are already hard pressed to meet their engagements, and as a result they feel that the situation is one that should be taken in hand. It must be remembered that at the present moment we are at the easiest period of the year for medical practice both of a private and of a State nature. The incidence of all ordinary diseases save certain epidemics is now distinctly lower than can be expected as winter approaches with the numerous and deadly conditions directly attributable to its more rigorous conditions. This is giving cause for thought among all who know how depleted already are the ranks of civil practices, and in many localities a feeling of apprehension has been created among those who are competent to look ahead and wise enough to know what to expect unless measures of security are taken beforehand. One very obvious point seems to have entirely escaped attention. It must be remembered that medical men also are liable to sickness and to the results of overwork, and if the demands on the civilian medical profession in this the healthiest season of the year are so large that efficient service can barely be maintained in any locality—and we are approaching perilously nigh to the danger-line—in harsher times the community must run the double risk, on the one hand of having a larger percentage of sick among them, and on the other of having a smaller medical service, a certain percentage of the doctors being themselves incapacitated.

To this double risk the population should not be submitted if it can be avoided, while it is enhanced still further by the sudden detachment from different areas of the recognised specialists for the district. The sooner those competent to deal with the situation are able to take it in hand the better it will be for all. It seems to us that the matter is one for conference and coöperation between the authorities at the War Office and the Central Medical War Committee, which represents alike the recruiting agency for the Royal Army Medical Corps and the machinery for the maintenance of the good health of the civilian population. The whole country, with regard to the medical service, as with regard to the other interests and amenities of life, is prepared to subordinate civilian to military interests, but where a certain amount of adjustment between military authorities and lay organisations can make the burden on the civilian population less hard to bear, while in no way imperilling the efficiency of the Army, such coöperation is greatly to be desired.

Arrested Tuberculosis and After-care Factories.

THE need is generally recognised for the continued care of all forms of tuberculosis which have been the subject of institutional treatment, but little has yet been put into practical effect. It would be a public misfortune if the scheme which was inaugurated by the late Dr. J. E. SQUIRE for the after-care treatment of sanatorium patients should be allowed to lapse for lack of his driving-power; but we cannot think that this will occur, so obvious is it that effort along the lines indicated would be amply repaid. Superintendents of sanatoriums have long recognised that the results of their work were seriously imperilled for want of proper supervision of their patients after leaving the sanatorium. Sanatorium treatment can do no more than build up health to the point of arrest of disease; it is not intended to maintain this condition—indeed, the amount of accommodation provided, in this country at any rate, forbids such prolonged attention. But patients who have benefited by their stay in the sanatorium return to their former occupation without any idea of the risks of relapse that are incurred; they work ordinary hours, many of them in the whirlpool of factory life. During their absence in the sanatorium domestic finances

have frequently become straitened, and the inducement to work strenuously in order to earn full wages is therefore very urgent. Small wonder, then, that many arrested cases quickly relapse, with the inevitable result, for recovery from tuberculosis seldom proffers itself twice to any man.

The superintendents of sanatoriums, fully aware that this industrial ordeal will sooner or later have to be faced by many of their patients, have attempted to prepare them for it by organising physical labour of various kinds; but valuable though such exercise may be, it inevitably lacks the stimulus of being remunerative, at least to the extent to which the skilled craftsman feels that he is entitled. In most cases, too, this improvised labour bears no relation to former occupations, and may, indeed, be detrimental to the resumption of such occupations, as, for instance, when the delicate touch of the typist or stenographer is dulled by handling pick and shovel for agricultural purposes. In a report published two years ago by the Medical Research Committee on the prevalence of pulmonary tuberculosis in the boot and shoe industry, the situation was carefully considered and an interesting recommendation made, the principle of which may well be applicable to other industries. We summarised[1] at the time the essential points of the suggested scheme, of which the following extract gives the gist:—

> Briefly, the scheme is to establish, in connexion with the ordinary form of sanatorium, a workplace for the manufacture of boots and shoes. Here consumptive operatives in an early stage of the disease and convalescing patients could carry on their trade under medical supervision for such hours as they are able, and earn wages in proportion. As health is re-established the working hours and earning capacity would be increased, until finally normal hours could be safely undertaken in many cases, and factory employment resumed. The conditions under which work would be done should preclude any possibility of the materials handled becoming sources of infection. It would be among the more important advantages offered by the plan for a factory sanatorium if as a result of his stay an operative could be taught how to carry on his handicraft under hygienic conditions. The influence upon his fellow men of his acquired habits after his return to the factory might be considerable. Many circumstances seem to point to the boot and shoe industry not only as one in which the evils of phthisis are conspicuous, but also as that for which the establishment of a sanatorium in which employment is provided is most easily practicable. The industry is not a scattered one, but is segregated in particular towns, and the nature of its technical processes raises no insuperable difficulties to their performance under sanatorium conditions.

The plan here advocated seems reasonable and practicable, and is one which should forthwith be carried out. But various administrative details come up for consideration. Would after-care factories be counted as sanatoriums with a right to claim grants? Would Approved Societies pay sickness benefit to inmates of a sanatorium earning wages for part-time work? The whole subject is one that points to the need of the general supervision of medical relations towards the State that would be supplied by a Ministry of Health; for a centralising body would be able to unite the authority of the Local Government Board over sanatoriums and that of the Home Office over factories, on the common ground of the after-care factory.

The present time is opportune for preparing a general scheme, inasmuch as at the end of the war there will exist a number of buildings well suited for conversion into after-care factories—namely, the extensive national factories now used for munitions of war. These factories consist of a large number of more or less isolated single storey workshops, connected together by convenient platform runways; while heating, lighting, and power are all laid on to each workshop. Canteens, ambulance-rooms, doctors' quarters are also in existence. The installation of the requisite machinery for the manufacture of boots and shoes, for printing purposes, or for the tailoring trade, when these workshops are no longer wanted for their present purpose, should not be an expensive matter. The Chairman of the Investigation Committee of the Medical Research Committee, to whose report we referred above, is at the moment the Minister of Munitions, and we trust that Dr. ADDISON will not hesitate to use the establishments which he has brought into existence to meet the necessity of war for the purpose of re-establishing the health of workers when they are no longer required for their original purpose.

[1] THE LANCET, 1915, ii., 1359, 1422.

Hospital Sunday, 1917.

ON Sunday, June 24th, the Metropolitan Hospital Sunday Fund will appeal to the generosity of the public in London and throughout the United Kingdom, and again, as in many previous years, we press that appeal upon all, hoping that what we urge may find a hearing beyond the circle of our usual professional readers. The shadow of war which hangs over us does not lighten, but we face the struggle with a steady hope for a brighter future to come, prepared to meet with fresh economies the drain of war upon our resources. With the hospitals the case is different. Not on the future do they rest their hopes in consolation for present conditions of stress and uncertainty. Theirs is the present. The hospitals are doing their share, and more than their share, in meeting the present needs of the nation, of its soldiers and of its citizens, relying upon the nation's gratitude and the generosity of the benevolent to help them to meet the bill. The ground of appeal is a familiar one; we made it last year, and we make it again now. In no year since hospitals have existed in London has their claim been stronger upon the public gratitude, and in no year has their need been greater or more obvious to all.

In reminding the public of its debt to the hospitals, the sense of justice should stimulate its generosity and result in freely giving. Probably a large section of the population still forgets to name the hospitals of London among its creditors. Now and again some innovation—or supposed innovation—in medicine or surgery attracts popular attention in the newspapers, as in the case of certain antiseptics. To the man in the street it

appears, no doubt, that someone working in a hospital laboratory has been inspired by a brilliant or a happy idea, and that something of real utility in saving the lives or limbs of our soldiers at the front has been the fortunate result. What we want him to realise is that years, or it may be scores of years, of patient and laborious work in those hospitals, have led step by step, through good report and evil report, in all the discouraging circumstances of restricted opportunity and lack of funds, not to isolated "discoveries" and fitful progress here and there, but to results already rendered memorable in every civil and military hospital. Medicine has strained every nerve to meet the huge demands of war without neglecting the needs of a civilian population which runs the multitudinous risks of industrial life. The hospitals of the United Kingdom have trained the physicians and surgeons for their work and have placed their services at their country's disposal. In the laboratories and operating wards of the hospitals the whole scientific equipment of medicine and surgery has been developed and organised, and on them all future progress rests.

We claim for the hospitals of London no more than their just share of this great work; but the appeal of Hospital Sunday is primarily for them. The Metropolitan Hospital Sunday Fund is an opportunity for rich and poor alike. Its contributors include those who can afford to give large sums, and those other thousands who can give small sums. Their mites count for much, and the personal interest which those mites represent counts for incalculably more. Sunday is a visiting day at most hospitals, military and civil. Thousands of relatives in London will be sitting on Hospital Sunday at the bedside of men shattered by deadly engines of warfare, racked by war's diseases, overwhelmed by its shock and strain. We ask all of these to remember the hospitals for which the Metropolitan Hospital Sunday Fund makes its collection on that day. But besides these we ask all our fellow citizens to remember that in war, no less than in time of peace, the daily work of the hospital must be carried on in spite of high prices and financial strain for which time affords no parallel. The dangers and ills of civil life are still with us, and their contribution to the list of sick and wounded, always a large one, is liable to sudden variations. The street accident daily brings its quota of maimed and injured to the hospital wards, a constant stream liable to sudden increase by the destruction which the present week has brought. London remains the centre of a nation struggling for its existence against the foes without and the subtler foes within, against which its hospitals are the chief line of defence, and we call upon its citizens to realise their indebtedness and to make a generous response.

AN AMERICAN RED CROSS SCHEME.—A plan by which large industrial corporations will declare special dividends for the Red Cross has been devised in America. It is calculated to yield a minimum of £5 000,000.

Annotations.

"Ne quid nimis."

THE CROONIAN LECTURES.

IN his first Croonian lecture, on Adaptation and Disease, last Thursday, Lieut.-Colonel J. G. Adami, F.R.S., justified his choice of subject on the grounds that administrative duties had debarred him from sustained laboratory research and that the time was more than ripe for bringing the investigations of the bacteriologist and of the student of immunity to bear upon the important problems of general biology. The supreme biological problem of our times had been that of the ways and means of evolution; but while the fight centred essentially upon the cause or causes of variation: whether variability was, in fact, primarily inherent, proceeding from within, or primarily acquired, proceeding from without—this basal problem had been largely neglected for the secondary problem, whether properties acquired by the parent could be transmitted to, and reproduced in, the offspring. After briefly recalling the views of Lamarck, Darwin, Herbert Spencer, and Weismann, Colonel Adami dealt in more detail with Sir William Bateson's latest hypothesis that when a new property manifests itself in an individual of any species, it is not new, not due to addition, but to subtraction and loss of properties already possessed. According to this view, what appears to be a new property is primeval, the manifestation of a property possessed by the forerunners of the species, which all along has lain latent, present but unable to manifest itself hitherto in consequence of the co-existence of inhibitory factors. The sudden appearance of new determinants in the germ cell and the consequent accretion of new properties form no part of the Batesonian doctrine which, pushed to its logical conclusion, means that the primal unit, or units, of protoplasm from which all living animal and plant forms have descended, possessed within it in a latent form the originals of every organ and of every distinctive portion of an organ or part, even down to the conformation and colouration of individual hairs and scales. According to this view, what we regard as the higher forms of life were really the lower, owing their development not to progressive accretions of properties but to the reverse, so that reversion, instead of being a degenerative manifestation, a loss of properties acquired by the species, became a recovery of higher and completer powers. Colonel Adami queried whether any exercise of mediæval scholasticism ever led to a more perverse conclusion than this. Valuable and fascinating as were the recent observations for the amplification of Mendel's law, that law only established the extent of variation possible *within the boundary of the species*. Employing Mendelian methods, we produce at most different strains of a species which by a cross fertilisation with other strains produced in turn individuals reverting to the usual type. Such interplay was not, however, capable of throwing light upon the progressive development of new species. Sir Ray Lankester saw in "direct adaptation," as adopted by Herbert Spencer, the fallacy of all Lamarckian doctrine. But the fact constantly impressed upon the student of immunity and the worker in pathogenic bacteriology was that "direct adaptation"—i.e., a specific modification in response

to specific alteration in environment—was one of the basal phenomena of living matter. Colonel Adami proposed, therefore, to consider in his later lectures (June 19th, 21st, and 26th, at 5 P.M.) the evidence of adaptation as it affected the pathogenic bacteria, passing on to adaptation affecting man and the higher animals, and concluding with the application of these data to our conceptions of disease and of evolutionary processes.

WAR AND INSANITY: LUNACY AND MENTAL DEFICIENCY IN 1915.

Two annual reports on lunatics and mental defectives have recently appeared. One of these, the Third Annual Report (for 1916) of the General Board of Control for Scotland, is largely of a statistical character, although sufficient is said to show the malign effect of the war in the curtailing of expenditure and the shortage of trained attendants in the asylums. The other is the Second Annual Report (for 1915) of the Board of Control for England and Wales, of which the first part, just issued, is general in character and deals with certain points of contact between the war and asylum practice. It emerges, for instance, from the English report that under present conditions it is impossible to form any judgment as to the influence of the war on the numbers of the certified insane. Of the whole population a certain proportion become insane in ordinary conditions, and of the 5,000,000 soldiers a proportion will similarly suffer. As the military age includes the most healthy and strong, a smaller proportion would be expected to become insane than in the general population, and it is noteworthy that there has been a decrease in the admissions to asylums. The number of notified insane persons in January, 1916, was over 3000 fewer than in January, 1915, contrasting with the average increase for ten years past of over 2000. The reduction does not appreciably affect any particular class, but the war has had several incidental effects on asylum practice. For instance, a number of large asylums have been converted into military hospitals, the superintendents becoming temporary officers of the Royal Army Medical Corps, while a large number of male attendants have joined the army, their places being taken in some asylums by female nurses. On the whole this has been found to answer well, but some asylums have declined to receive maniacal men on this account.

In English borough and county asylums the decrease in male admissions was nearly twice as great as in females. This has been due to two causes: first, to the absence of men at the war, and, secondly, to the very serious and important reduction of the staff of male attendants called up to service, with the result, already indicated, that certain male patients are not sent to asylums at all. Many soldiers who have become insane are treated in military hospitals at home or abroad and are not certified, thus escaping what would sometimes be an unjustifiable stigma, while non-certification makes possible their return to the Army. Although the reduction in the number of admissions is, therefore, on several grounds and to some extent fictitious, the increase of employment and the improved condition of the working classes may be reasonably inferred to have had their influence. The death-rate among the insane population remained unaltered for the year, the excess of male deaths being due chiefly to general paralysis. But asylum dysentery increased during the year and this should give rise to serious thought, as a similar increase has been previously noted. In 1914 there occurred in 97 English asylums 1324 cases of dysentery, in 1915 the number was increased by nearly 100 per cent. There is room here for strict investigation, and it is worth noting that the disease had shown its growing prevalence before war conditions could play any part in causation.

Turning to work of a constructive nature, attention is called in the English Report to the growing feeling which exists among all classes that a time has come when the feeble-minded should be protected and the welfare of society promoted by the establishment of reception houses and colonies where defectives can be detained and trained. The war, unfortunately, has hindered the full development of the scheme, but enough has been done to prove the utility of the measure. Returns are given in the English Report showing the frequency with which the feeble-minded girl becomes the mother of several illegitimate children who may inherit mental and moral weakness, and who at any rate are sure to be brought up in the worst of environment and social conditions. There is no need in these columns to give further examples of the terrible danger that is constituted by that class of persons who have improper appreciation of the rules on which social life must be conducted, nor to insist on the need for a clear recognition of the responsibility of the State for the troubles which these unfortunates unwittingly bring upon themselves and on the whole of society. The partial and spasmodic treatment of these cases by the Poor-law is characterised as a grave administrative extravagance, and all must regret the small progress that has been made, owing to the war, in applying the provisions of the Mental Deficiency Act. Some compensation is fortunately afforded by the real impulse which has lately been given to scientific research into mental disease and mental defect.

THE BATTALION MEDICAL OFFICER.

THE Army is fortunate in possessing hygienists of high standing, text-books in sanitary science of great lucidity, and sanitary orders which have been worked out in the light of practical experience for a period now of nearly three years. Army sanitation has, in fact, attained a high level, far higher than can be hoped for in many departments of our home sanitation where the enforcing power of military discipline is absent, and the whole nation must take carefully to heart in the peace times which are coming the lessons afforded by the war. And it must be remembered that even in the presence of military discipline it is the individual soldier who carries out the sanitary régime, and on him, in the end, the efficiency as a whole of any sanitary administration depends. It is here that the battalion medical officer can play his part, for he is brought into intimate personal contact with the men, and on him rests the onus of impressing the elements of sanitation on them in a form which they can understand. In another column Captain Hugh W. Bayly lays stress on this position enjoyed by the battalion medical officer, and suggests that as a matter of routine such officers should issue standing orders for the guidance of those under their sanitary charge. The battalion is the smallest unit in military life, and, like the family in civilian life, tends to have individual habits of thought and its own way of expressing

them; and it is probable, as Captain Bayly suggests, that the most efficient sanitation may be got out of the battalion by a medical officer who studies its particular conditions. For the battalion to which he was attached as medical officer Captain Bayly drew up a code of sanitary standing orders which he found successful in that case, and we commend his suggestions to the consideration of other battalion medical officers. In an appointment which is frequently of a temporary nature it is not very easy to take the keen personal interest in the work which alone ensures its efficiency, but the battalion medical officer may well remember that the saving of lives depends as much, if not more, on his insistence on the sanitary instruction of the private soldier as on the more dramatic work of rescue and first-aid to the wounded.

ROYAL MEDICAL BENEVOLENT FUND: AN EMERGENCY APPEAL.

IT is now nearly a year since an appeal was made by the office-bearers of the Royal Medical Benevolent Fund for liberal support to a special emergency fund to assist medical men in temporary difficulty in consequence of having joined the Army Medical Service. A ready response was given to this appeal, enabling the Fund to deal with a number of urgent cases where help was needed, and to render in some of them more substantial assistance by coöperating with other benevolent societies, such as the Officers' Families Fund and the Professional Classes War Relief Council, any possible overlapping of effort being thus avoided. As time goes on the need has, unfortunately, steadily become greater, and in a letter this week in our correspondence columns an appeal is made for a much larger sum than was obtained last year. This sum should be forthcoming, whether from within or without the profession. The demands made on the medical man at the present time are searching and imperious; he is recognised as being more essential than ever to the community, and it is only fair that his work should not be hampered by mental anxiety for his own financial position, or that of his family if he is killed or disabled. The medical profession may well be grateful to the officers of the Benevolent Fund for their discerning labours on its behalf.

AN ESKIMO DEFICIENCY DISEASE.

THE recently-recognised group of diseases attributed to deficiency in the diet of certain ingredients present only in small amount (vitamines) is very limited. Beri-beri and scurvy are the best-known examples. In the *Boston Medical and Surgical Journal* of May 3rd Dr. John M. Little has described a disease known to the Eskimos of Labrador and Baffin Land as "kallak," which he regards as of this nature. The diet of this primitive people is mainly animal, and consists of seals, caribou, birds, and fish. Where civilised food is not available they depend for carbohydrates mainly on berries and on the partly-digested stomach contents of animals killed. Their great feast after killing caribou is a thick soup made of its stomach contents and blood. The mosses, grasses, young shoots, and leaves eaten by these animals are possibly transformed by their hardier digestion into forms assimilable by man. It is to be expected that when stress of circumstances reduces this limited dietary deficiency disease would arise, and this is so. The frequency of scurvy among the Eskimos is well known, but they appear to be also liable to another deficiency disease. Ten years ago, before the term vitamine was coined, Dr. Little described "kallak" in the *Boston Medical and Surgical Journal* as an endemic disease commencing with an eruption of pustule-like lesions in crops on the hands, elbows, buttocks, and other parts, no organisms being found until secondary infection takes place. There is intense itching, the course is protracted, and recovery ultimately takes place. Discussing the etiology he said: "While it may occur at any time of year, if they have plenty of seal flesh to eat they don't have kallak. Most of the cases, as well as the worst cases and the epidemics, occur in the autumn, after they have been living almost exclusively on a fish diet, and especially after failure of the berry crops." The best treatment is the addition of seal meat and berries to the diet. Dr. Little now suggests that the disease is due to some fat-soluble vitamine present in the fat of seals and caribou. That the disease is not racial but is due to the mode of life of the Eskimos is shown by the case of a young Scotchman who was wrecked on a whaler in Baffin Land and lived the Eskimo life for a year. He gave Dr. Little a good description of kallak, and said that he had almost died from it.

TECHNICAL OPTICS.

WE understand that arrangements have recently been completed for an important development in national industry on the scientific side by the establishment of a new department of technical optics in connexion with the Imperial College of Science and Technology at South Kensington. The department in question forms part of a larger scheme adopted by the London County Council in August last for the provision of instruction in this most important subject (in which the Council promised to find certain moneys for the scheme, if the Government also contributed), including post-graduate and research work at the Imperial College, a trade school, and senior day and technical courses at the Northampton Institute, and junior technical courses at two junior technical institutions, one in North London and one in South London. Since August last the Government, including the new Department of Scientific and Industrial Research and the Imperial College, have decided financially to support the Council's scheme and all the necessary assents have been obtained. The amount of money immediately available is £4000 a year for working expenses and £5000 for equipment and more immediate necessities of the department. The new department is under the management of a Technical Optics Committee of which the Right Hon. Arthur H. D. Acland is chairman, and at present it consists of 13 members representing the Admiralty, the Army Council, the Ministry of Munitions, the Royal Society, the National Physical Laboratory, employers in the optical trades, glass manufacturers, and the Imperial College; while two further members have yet to be elected representative of glass-workers and metal-workers. The same committee appointed by the London County Council is also an advisory committee to the Council. Mr. Frederic J. Cheshire has been appointed head of the new department at the Imperial College for a period of five years, with the title Director of Technical Optics and Professor of Technical Optics at the Imperial College. Mr. Cheshire's long experience and great ability in optical matters are well known, and practically ensure a successful begin-

ning. He has been associated with optical instruments for many years at the Patent Office, and since the formation of the Ministry of Munitions has been Deputy Director-General of the Ministry and Technical Director of the Optical Department of the Ministry. He is the present President of the Optical Society. It is expected that, subject to the conclusion of certain arrangements with the Treasury, Mr. Cheshire will accept the directorship, and it is anticipated that the organisation of the Department will be rapidly completed, and that training will begin at an early date.

CHESTNUTS AND ACORNS IN WAR SERVICE.

THE manufacture of modern munitions has so far implied a certain demand on cereals which otherwise could be used for food. This is an unfortunate diversion, and it is gratifying to learn that, instead of using cereals, other materials not so far made fit for human food, as, for example, the common horse-chestnut, are to be employed. We may point out similar possibilities in regard to the acorn, vast quantities of which are wasted every year. The composition of these nuts has something in common, as will be seen from the following figures:—Horse-chestnut: water, 38·9 per cent.; protein, 4·8 per cent.; fat, 4·6 per cent.; carbohydrate, 50 per cent. Acorn: water, 6·3 per cent.; protein, 5·2 per cent.; fat, 4·3 per cent.; carbohydrate, 45 per cent. The most important constituent of both is the carbohydrate, in the form of starch, while the acorn should have further value on account of the substantial proportion of fat which it contains. Neither nut has as yet been used to any extent for human consumption, and it is possible that their utilisation in some way or other, whether for food purposes or not, may be one of the results of the relative food shortage. The first step has now been taken in the substitution of these nuts for cereals in the production of munition agents. Other abundant vegetable products may also be pressed into service. It is, of course, possible to convert wood, linen, cotton, and the like into sugar, but the process of conversion does not yet appear to have attained practical dimensions or to have reached an economic stage.

THE "INDEX-CATALOGUE."

BY a happy coincidence, along with the group of American surgeons who have come to Europe's aid has arrived the last volume completing the second series of the great index-catalogue of medical publications, issued by the Surgeon-General of the United States Army from the Medical Museum and Library. The value of this catalogue to medical science it would be hard to exaggerate. It is one of the principal agents in the standardisation of medical records, ensuring that published work shall not be overlooked by later authors. The orderly arrangement of the index is in itself a work of genius, and has formed a model for other medical libraries all over the world. The Surgeon-General's library contained on August 1st, 1916, when the preface to this volume was written, more than 224,000 volumes and 337,000 pamphlets. In the index-catalogue as far as published appear 346,000 author-titles and 305,000 book-titles, as well as over a million journal articles and 5000 portraits. Within the last five years have died both the men mainly responsible for the production of the catalogue—viz., the chief assistant librarian, Dr. Robert Fletcher, in his 90th year; and Dr. John S. Billings, the principal upbuilder of the Surgeon-General's library, and the creator of its index-catalogue, at the age of 75. The general plan of a combined index of authors and subjects, arranged in dictionary order in a single alphabet, and the system of subject rubrics with cross references, were devised by these two men and blocked out prior to the publication in 1880 of the first volume of the first series; and these principles have been adhered to ever since. Dr. Fletcher devised all the abbreviations of periodicals employed in the catalogue up to the time of his death, and a list of these abbreviations and of the medical periodicals of the world—forming, in fact, almost a reference library in itself—is contained in this volume of the index-catalogue. Here the convenience of the reader has counted more than rigid adherence to uniformity, and this principle is conspicuous throughout the work as a whole. A third series of the catalogue is now in preparation. The medical profession is under a deep debt of gratitude to the Surgeon-General of the United States Army for a treasure-house of information.

THE PHYSIOLOGY OF THE PRE- AND POST-CENTRAL AND PARIETAL CONVOLUTIONS.

THE exact function of the central and parietal gyri has long been a subject of dispute among physiologists and clinicians. According to one view the cortical zones for motion and for sensation, situated in the central convolutions, are one and the same, physiologically speaking: in the same cortical area where end the afferent neurons from a limb the movements of that limb are initiated. Opposed to this conception, which has been upheld by a number of distinguished investigators, is a theory of the sensomotorium which regards the motor and sensory centres as anatomically and physiologically separable, the former being localised in the precentral and the latter in the postcentral gyrus. Various facts appear to lend support to this second theory. The cytoarchitectonic arrangement of the cortical layers of the precentral gyrus is quite distinct from that of the postcentral, and though differences in structure may not correspond to differences in function the fact is undoubtedly suggestive. With lesions of the precentral there is marked degeneration of the cortico-spinal (pyramidal) tract; with lesions of the postcentral practically none. In a number of carefully observed clinical cases pure lesions of the precentral have been unaccompanied by sensory symptoms, or these, if present, have been transient, while lesions confined to the postcentral or parietal areas produce symptoms that are almost entirely of a sensory nature. Recent experimentation in anthropoid apes and in man also has definitely shown that with weak electrical stimuli individual movements can be elicited only from the precentral gyrus, whereas in the case of a conscious patient whose postcentral convolution was thus stimulated sensations were produced and referred to the opposite hand, but they could not be obtained from the precentral. Finally, experimental extirpation even of small areas of the precentral cortex is always followed by crossed paresis or paralysis, while with removal of large sections of the postcentral no paralysis, or only a transient one, results. Mention ought, perhaps, also to be made of a third view, associated with the name of the late Dr. Charlton Bastian, according to which the central

gyri are purely sensory, the motor centres being entirely subcortical or spinal. Dr. M. Minkowski, of the University of Zürich, has published in the *Correspondenz-blatt für Schweizer Aerzte*, of March 24th, a detailed record of experimental research which he has conducted with a view to elucidating the subject. He used apes for the purpose, examining them at intervals for a year or longer after the operation. His conclusions may be summarised as follows. Removal of the precentral gyrus results in an immediate complete crossed hemiplegia, gradually clearing up and leaving a permanent hemiparesis; contralateral hemihypæsthesia is only an initial symptom which soon disappears, with a slight defect of deep sensibility as the only persisting impairment. Extirpation of the postcentral gyrus causes no paresis even at the beginning, but only a loss of sensation on the whole of the opposite side of the body. This involves particularly tactile sensibility and localisation, in which improvement gradually takes place, though there remains a permanent defect in the hand; pain appreciation is but slightly affected and soon recovers; deep sensibility is much impaired and improves slowly and imperfectly. After removal of the postcentral and the parietal convolutions, including the supramarginal, no paresis follows; there is, however, a severe hemianæsthesia for all forms of sensation, more marked than with removal of the postcentral alone; restitution is very incomplete; after two years (in one animal) touch and localisation of touch were still quite lost, while the sense of pain was distinctly less imperfect and the localisation of painful stimuli was often correct. Deep sensibility remains badly defective. The author agrees with the view that the motor and sensory representation of the opposite side of the body extends over the precentral, postcentral, and parietal cortex, but this region constitutes no uniform sensomotorium; on the contrary, it is subdivided functionally in a fashion that follows, to some extent, architectonic differences. Deep sensibility appears to be represented over the whole of the area (ataxia occurs as a temporary symptom only with involvement of both the parietal and the postcentral cortex); cutaneous sensibility with the appreciation of local signs is mainly but not entirely post-central; touch is widely represented over the whole, perhaps even more widely in a diffuse way; pain is less impaired than any of the other forms of sensation, and therefore has probably, according to Dr. Minkowski, a specially wide and diffuse representation in the cortex.

THE METROPOLITAN WATER-SUPPLY.

WE deal with the three monthly reports on the metropolitan water-supply issued during the first quarter of the present year. It is interesting to consider the amount of rainfall in relation to the quality of both the raw and filtered waters. The opening months of the year were characterised by a drop in the mean rainfall. Thus in January the mean rainfall was 1·55 inches, being 0·68 of an inch below the average mean rainfall for that month during the previous 34 years. In February and March the figures were 1·12 (−0·95) and 2·15 (−0·03) respectively. With regard to the quality of the water in *January* chemical examination showed that the raw Thames and Lee waters deteriorated as judged by the permanganate, turbidity, and colour tests, and improved as regards the albuminoid nitrogen test. The raw New River water deteriorated in quality on all tests. The filtered waters improved in quality as judged by the albuminoid nitrogen test (excepting New River, Grand Junction, and Lambeth), permanganate, and colour tests (New River, Chelsea, and Lambeth excepted). There was no change in the Southwark and Vauxhall supply as regards colour test. Comparing these monthly results with the 1916 averages, the raw Thames and New River waters yielded results worse than the average as judged by the usual tests excepting that for albuminoid nitrogen. Lee river water was better except as regards turbidity. The filtered waters yielded worse than average results by chemical and colour tests, East London, Kempton Park, Grand Junction excepted. All three raw waters contained in January more bacteria than the average for 1916, while the filtered waters were satisfactory. Coming now to *February*, the results of chemical examination showed that all three raw waters improved in quality, as judged by the albuminoid nitrogen, permanganate, turbidity, and colour tests. The filtered waters also improved in the light of these tests, and compared with the 1916 averages the raw Thames and Lee waters yielded better results. New River water (raw) was also better than the average as judged by the albuminoid nitrogen and permanganate tests, but worse as regards turbidity test, while there was no change in regard to the quality of colour. The filtered waters yielded results worse than their respective averages, as judged by the albuminoid nitrogen test (New River, Lee, and Chelsea excepted), but better than the average (Lambeth and Southwark and Vauxhall excepted) as judged by the permanganate and colour tests. The raw Thames and New River waters contained more bacteria and the raw Lee water fewer than their respective averages for the year 1916, while the filtered waters showed a high standard of bacteriological purity. In *March*, with a practically normal rainfall, chemical examination showed that the raw Thames and Lee waters deteriorated in quality as judged by the albuminoid nitrogen, permanganate, turbidity, and colour tests, while the raw New River water improved, as judged by the albuminoid nitrogen and colour tests, but deteriorated as regards permanganate and turbidity tests. The filtered waters showed deterioration in quality in some instances, while compared with the 1916 averages the raw Lee and New River waters yielded more favourable chemical results, but they were worse as regards the turbidity test. The raw Thames water gave better results by the chemical tests, but was not so good on turbidity and colour tests. The filtered waters yielded results worse than their respective averages in many instances, but as regards colour all the treated waters showed an improvement. The raw river waters contained fewer bacteria than their respective averages for the year 1916, while the filtered waters gave not unsatisfactory results.

THE Cavendish lecture of the West London Medico-Chirurgical Society will be delivered at the West London Hospital on Friday, June 22nd, at 8.15 P.M., by Captain Andrew Macphail, C.A.M.C., professor of history of medicine at McGill University, Montreal, who has chosen as his subject, "A Day's Work." Representatives of the medical services of all the Overseas Forces will be present and past Cavendish lecturers and the presidents of London medical societies are specially invited. Invitation cards may be had on application to Dr. Reginald Morton, 66, Harley-street, W. 1.

CANADA.

(FROM OUR OWN CORRESPONDENT.)

The War Cripple: Accommodation and Vocational Training.

A YEAR ago the total number of soldiers returned wounded to Canada and still under treatment was 1530; on Dec. 2nd, 1916, the number stood at 2634; and since the beginning of the present year the numbers have rapidly increased, reaching high-water mark—namely, 5677 on April 15th, in spite of hundreds discharged in the meantime. Nearly all the recent arrivals have been convalescents, no large number of bed cases having been returned so far. According to the recent report of the Military Hospitals Commission, Canadian invalids in England have been reduced in numbers from 20,256 on Oct. 20th, 1916, to 14,545 on March 30th, 1917, the distribution being as follows: In Canadian hospitals, 8926; in sanatoriums for consumptives, 92; in British hospitals, 5527. The duties of the Canadian Military Hospitals Commission are, in the main, two-fold, to provide hospital and other accommodation for the returned invalid soldier, and to supervise his vocational training. The actual treatment and provision of medical personnel in the hospitals remain in the hands of the Army Medical Corps.

In regard to severer injuries the Military Hospitals Commission arranged some time ago with several general hospitals in Canada for accommodation for 1600 "bed cases." Accommodation is being provided for 1200 others in buildings taken over or erected by the Commission itself. At St. John, N.B., the armouries have been converted and are now ready for 350 of these cases; at Kingston, Ontario, the Convocation Hall of Queen's University has been turned into a hospital and is now ready for use with 550 beds; at Winnipeg, Man., a new hospital has been erected in the old Agricultural College with 320 beds, to be divided between convalescent and active hospital cases; at Quebec and Montreal the Savard Park and Grey Nuns' Convalescent Hospitals may be used for convalescent bed cases later on. Both are ready without any alteration.

For consumptives 1250 beds are now available, and the accommodation is being largely increased. At Kentville, N.S., the Commission has added two pavilions for 64 soldiers, with the addition of a vocational building; at Kingston, Ont., the new buildings at the Sir Oliver Mowat Sanatorium have been completed for 175 patients; at Hamilton, Ont., three smaller pavilions and a vocational building are finished, and two large pavilions are nearly completed; at London, Ont., three new pavilions are already in use and an infirmary building is being added; in Manitoba two soldier pavilions are being added to the provincial sanatorium at Ninette; in Saskatchewan the Earl Grey School in Regina is being transformed into a sanatorium; an infirmary building is being added.

More room is being provided for convalescents. A convalescent hospital is being erected at Halifax, N.S., with three residential buildings for 300 men, to be finished by July 1st; two Presbyterian College buildings to accommodate 125 men have also been taken over. At Sydney, Cape Breton Island, a private house in fine grounds is in commission with accommodation for 100 men. At Montreal the former Loyola College has been taken over and 100 are there, with room for 250; St. George's Home, holding 50 men, is also occupied. At Whitby, Ont., the magnificent hospital for the insane of the Ontario Government has been leased providing accommodation for 1500 before the end of the present summer and a vocational building is under construction; at Guelph, Ont., another fine provincial building will shortly be ready with accommodation for 800 men and will be the great re-education centre of Ontario for the men who need training for new trades; the new Salvation Army building in North Toronto will be an orthopædic hospital for some 450 men needing artificial limbs, a special building to be erected in the large hospital grounds for the Toronto artificial limb factory; a home for 30 incurables has also been established in a former private residence in Toronto, the first of its kind for Canadian soldiers. There is also a training centre for masseurs at a mission-hall in Toronto. At Coburg the Ontario Military Hospital will have its capacity raised from 144 to 275 by the erection of new buildings reserved for curable cases of shell shock and other nerve troubles. By the acquisition of Pickering College, Newmarket, Ont., another hospital for the insane has been established for 150–200 returned soldiers. At Moosejaw, Sask., the Ross Park School has been secured, and with two auxiliary buildings in the grounds will take 400 men. In Saskatoon, Sask., the handsome building of the Y.M.C.A. has been taken over for 158 men. At Edmonton, Alta., the College is being taken over from the Methodist authorities, and will accommodate 300 men. Near Vancouver, B.C., two school buildings are being transformed for 450 men, 50 acres of land being available for farming and other purposes. Near Victoria, B.C., a charming beach hotel is already occupied, and the accommodation is being increased from 125 to 225. At Sydney, on Vancouver Island, the rest-haven is being increased from 160 to 200.

At the ports of arrival great improvements are being made for men immediately on their arrival from overseas. At Halifax, N.S., a clearing hospital with 450 beds is already in use, part being reserved for tuberculous patients; the provisions for attention and care there are excellent, as well as on the hospital trains. At Quebec, the clearing depôt, formerly the immigration building, is being remodelled, and will house 1000; special accommodation has been set apart for cases of tuberculosis and mental derangement.

Altogether between 500 and 600 workmen are now at work on the various buildings mentioned for reception, treatment, and training of the returned Canadian soldiers.

The bodies entrusted with the duty of watching over the interests of discharged soldiers are the Military Hospitals Commission, the Provincial Commissions, and the Board of Pension Commissioners. The problem of securing the proper return of discharged and disabled men to civilian life will be made less difficult if a knowledge of the duties of these bodies and of the measures by which disabled men are cared for becomes general. The medical profession in Canada is performing a work of public value by spreading a proper understanding of these matters, and convincing soldiers and civilians alike that it is the duty of disabled men to accept all that treatment and training can do for them.

Toronto, May 1st.

THE CONTROL OF VENEREAL DISEASES.

Treatment of Venereal Diseases in Belfast.

ON June 6th, at a meeting of the board of management of the Royal Victoria Hospital, Belfast, it was unanimously decided to form a special department for the treatment of venereal diseases, as suggested by the medical staff.

The American Journal of Syphilis.

The second number of this new journal has reached our hands. It is published quarterly by the C. V. Mosby Company, of St. Louis (801–807, Metropolitan Buildings, St. Louis, Mo. Yearly subscription $5, or $5.80 in foreign countries), and edited by Dr. LoydThompson, of Hot Springs, Ark., assisted by an associate editor and 15 departmental editors, among whom may be noted the names of H. Noguchi (New York), E. L. Opie (St. Louis), L. F. Barker (Baltimore), and Major C. F. Craig, of the United States Army. On the cover appears a quotation from Sir William Osler: "Know syphilis in all its manifestations and relations and all other things clinical will be added unto you." This number contains nearly 250 pages of text, mostly devoted to original articles, the first of which is a reprint of Dr. Noguchi's Harvey lecture on spirochætes, an exhaustive study of the natural history of all known varieties of this group, containing a bibliography of 283 publications. Dr. F. Proescher and Dr. H. A. Seil (Pittsburgh, Pa.) contribute a long paper on the action of vanadium with particular reference to syphilis, basing their conclusions on experimental work with animals. A supplementary clinical contribution by Dr. A. W. Stillians (Chicago, Ill.), who used sodium hexavanadate in doses of 0·03–0·06 gm. intramuscularly or intravenously in cases of primary and secondary syphilis at a dermatological clinic, contains the conclusion that the salts of vanadium have a specific effect on syphilis, clearing up the clinical manifestations and favourably affecting the Wassermann reaction. Other papers deal with serological reactions and clinical cases. The number ends with an abstract of current syphilis literature edited by Dr. W. H. Deaderick (Hot Springs, Ark.), including, however, only four extra-American out of a total of more than 50 articles. The character of this journal amply justifies its appearance, and its issue should be a useful adjuvant to the campaign against syphilis.

Correspondence.

"Audi alteram partem."

WAR EMERGENCY FUND OF THE ROYAL MEDICAL BENEVOLENT FUND.

To the Editor of THE LANCET.

SIR,—The time has come to make a further appeal for the War Emergency Fund. This fund was instituted last year to afford assistance to members of our profession who, in consequence of having joined the Army Medical Service, find themselves in temporary difficulties. Many medical men when called up had to leave on very short notice, without time to make adequate provision for the continuance and maintenance of their practices during their absence. As the result they have had to face a severe fall in income even when supplemented by Army pay, while many expenses, such as rent, insurance, taxes, family maintenance, and education, could not be reduced. Although in a year or two after their return it may be hoped those affected will recover their position, still in the interval that help is and will be necessary, and it is to meet these needs that the War Emergency Fund was established.

To be effective the grants must be made on a liberal scale, and the fund from which they are to be drawn must be a large one. The sum obtained last year was about £4000. This is quite inadequate, as at least £25,000 will be required, if even a small proportion of those requiring assistance is to be helped. From the wealthier members of the medical profession, it is hoped, substantial sums will be received, but everyone will feel it a duty which he owes to his less prosperous colleagues to give the most liberal donation he can afford.

At the same time the appeal is not, and ought not to be, restricted to the medical profession. The public, too, may be rightly called upon to bear its share, and to show by liberal contributions its appreciation of the special services so freely rendered by the medical profession to the country.

The War Emergency Fund is a special department of the Royal Medical Benevolent Fund. It is kept separate and distinct from the ordinary operations of the general fund and is under the management of a committee specially appointed for the purpose. Communications should be addressed to the Honorary Secretary, War Emergency Fund, 11, Chandos-street, Cavendish-square, W. 1, to whom cheques should be made payable.—We are, Sir, yours faithfully,

SAMUEL WEST, President.
CHARTERS J. SYMONDS, Hon. Treas., Col., A.M.S.
June 9th, 1917. G. NEWTON PITT, Hon. Sec., Major, R.A.M.C.T.

THE ANTISEPTIC "FLAVINE" (ACRIFLAVINE).

To the Editor of THE LANCET.

SIR,—Under the above heading an official statement by the Medical Research Committee appeared in your journal last week. As the original publication concerning "Flavine" was made from this department and based on work by several members of the staff (Browning, Gulbransen, Kennaway, and Thornton [1]), the unfortunate impression might be created unintentionally in the minds of those reading the Medical Research Committee's statement that we had neglected to acknowledge its share in furthering this work. I would, therefore, add to what it has said that when after the outbreak of the war it seemed to us that further investigation on antiseptics was urgently required, the Medical Research Committee was approached with a view to securing its support for this department of the Middlesex Hospital on the subject, and we met with most cordial interest, the first material outcome being that the Committee provided the emoluments of one part-time worker. As a result of the combined facilities afforded by the Hospital and by the Medical Research Committee it was possible to resume work on the lines of that which had been done by myself along with Gilmour [2] in Professor Muir's department at Glasgow University some years ago and before this country enjoyed the benefit of the operations of a State Medical Research Committee; thus we were able here to develop the investigation with a view to a practical application in the treatment of infected wounds. The introduction of Brilliant Green as an antiseptic in the treatment of wounds by Leitch [3] appears to have been a valuable practical outcome of attention drawn to this substance by our earlier work, and we have also recommended "Flavine" ("Acriflavine") as a result of the continuation of this work, the original experimental part of which was carried out here with a sample which had been supplied to us under the auspices of the late Professor Ehrlich in 1912. The Department of Biochemistry and Pharmacology of the Medical Research Committee has been especially helpful by preparing the latter compound, and so affording a considerable quantity for clinical trial of what, up till recently, we believed to be the most valuable member of this group; in this way they supplemented our slender store of somewhat less suitable compounds of the same type (acridine dyes), although the latter, judging by the opinion of Colonel Pilcher, D.S.O. (see Browning, Gulbransen, Kennaway, and Thornton,[1] also James [4]) and the report by Dr. Ligat,[5] also proved valuable clinically. The assistance afforded by the Medical Research Committee, as well as by the Royal Society's Scientific Grants Committee, towards this work of the Bland-Sutton Institute was acknowledged in the only publication which we have made. It is, of course, almost unnecessary to say that neither the staff of the Institute nor the Hospital has been concerned in any way with the production and supply of "Flavine." The Medical Research Committee's Department of Biochemistry and Pharmacology has since then continued to give us valuable aid, especially by providing an experimental supply of "Proflavine" (the basic constituent of which had been examined by Browning and Gilmour [6]). We have had no opportunity of acknowledging the latter, as we have as yet made no publication on the investigation of its properties. However, the tribute to the Committee's aid paid by Sir John Bland-Sutton in his speech at a recent quarterly meeting of the Board of Governors of the Middlesex Hospital and widely published in the daily press prior to the appearance of the Medical Research Committee's official communication, would appear to have anticipated the latter in a generous and sympathetic correction of any erroneous impression which might have existed anywhere in the public mind.

I am, Sir, yours faithfully,

C. H. BROWNING.

Bland-Sutton Institute of Pathology, Middlesex Hospital, June 11th.

*** Since receiving Dr. Browning's letter the following communication has reached THE LANCET from the Medical Research Committee:—"By the courtesy of Dr. Browning the Committee have had an opportunity of seeing the foregoing statement. They would entirely confirm the accuracy of the account Dr. Browning gives. Their communication to the lay press last week was made to correct so far as possible the results of recent statements made in the lay press which were based upon misapprehension of the present situation in regard to the properties and the supply of Acriflavine, and must have been an equal source of embarrassment to all concerned. They would greatly regret that their communication should be read in any other sense."

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—The last course of Lumleian lectures [1] relates without comment the transition from the purely myogenic conception of the excitatory mechanism of the heart, entertained not long ago by the new cardiologists, to the neuro-myogenic now gaining favour. The lecturer duly erects the familiar back-pressure ninepins in the new cardiological bowling-alley, of which the neo-cardiologist appears to be capable of entertaining only one conception, and proceeds to knock them over with his modern aspect bowls of cardiac failure. He makes no more sufficient reference to the influence of the mechanical valvular factor in the circulation than did Sir James Mackenzie, the Oliver-Sharpey lecturer in 1911, although some remarks of the latter in his letter in THE LANCET of May 26th suggest that his horizon has been somewhat widened on this point since that not very distant date. Questions of blood weight, blood pressure, and the relative influence of the arterial

[1] Brit. Med. Jour., Jan. 20th, 1917.
[2] Journ. of Path. and Bact., vol. xviii., 1913, p. 144.
[3] Brit. Med. Jour., Feb. 12th, 1916. [4] R.A.M.C. Journ., March, 1917.
[5] Brit. Med. Jour., Jan. 20th, 1917. [6] Loc. cit.
[1] The Lumleian lectures were published in THE LANCET of March 17th, 24th, and 31st.

and auriculo-ventricular valvular apparatus are not considered by Dr. G. A. Sutherland, while the differing conditions of the right and left cardiac circulation are quite inadequately dealt with, and in so far as they are considered at all, their concern with any specially modern aspect of heart disease is not obvious. He criticises at length some conclusions of Professor A. R. Cushny on the action of digitalis (to which Sir James Mackenzie also seems to refer in his letter in THE LANCET of May 26th) which do not quite square with a current conception of the new cardiology—that, namely, which denies the direct tonic action of the drug on cardiac muscle; makes, it will be admitted, no very generous reference to the contributions of previous workers; and concludes somewhat interrogatively by expressing the hope that he may convey to the rising generation of new cardiologists the benevolent regard of the venerable Fane of Harvey.

As I have said, in all this there is nothing very striking, original, or generous, yet this course evinces a peculiar resurgent property for discussion, as though it were the stalking horse of a propaganda in an unsympathetic atmosphere. The protagonist of the Newer Thought himself, in your issue of May 26th, now trundles another ball down the resounding alley already mentioned, to demolish the last standing pin of previous aspects of heart disease, with some added generalisations upon the philosophy of reaction and progress, implying, of course, a monopoly in the search of truth for those whom he regards as progressive. It is not my intention to follow him over the whole course of his remarks, or to consider either the novelty or utility of the semeiological index to the fruitful research of the future, on which he dilates. One appears to have been engaged in this research more or less all one's lifetime, but from the distinction which Sir James Mackenzie draws between the microscopist and the clinician I gather that he thinks more attention should be paid to the living phenomena of disease than to their explanation by ultimate results in structural change. In this connexion an excellent lecture by Peter Mere Latham (*b.* 1789) may be read with advantage (Heart Disease, Lect. IV.). I shall restrict myself to the consideration of that aspect of the question with which Sir James Mackenzie associated my name in his letter—namely, the significance of murmurs—and hope, if my matter does not convince him and his school of thought, that my manner may be controlled by the spirit of the first and greatest of the aphorisms of the Father of Medicine, the immortal first clause of which forms the motto of the Royal College of Physicians.

Is not this persistent attack upon back-pressure conceptions based upon a misinterpretation of symptoms and a misapprehension of the views of the majority of physicians for at least a generation? For what is back-pressure? Is it not the result of the retention in some degree in the heart, of blood which should be more easily projected from it? When Dr. Charles Bolton in his recently related experiments[2] produced ascites by partially ligaturing the inferior vena cava in cats, did he not produce as an immediate result back-pressure in an acute degree? For what purpose does the staircase of venous valves exist except to enable the blood to climb against gravitation during the diastolic pause in propulsion in one section of circulation and to prevent systolic back-pressure in another section? That the *vis a tergo* failing renders the climb of the blood more difficult is surely not a new discovery. From a study of the quadruped as compared with the biped circulation I showed in 1878[3] how the horizontal required a more powerful left ventricle than the erect animal, to produce an easy transit of blood, and failure of left ventricular force does not act solely by the diminution of propulsive, but also by the lessening of absorptic power with delay or rise of pressure in the pulmonary circuit and the right heart.

A young man, otherwise healthy, eats a heavy supper, vomits, complains of pain in the chest, becomes pallid, and dies within an hour. On examination the utility, even of the pulmonary arterial valves, is vindicated by the proof of their having ruptured and caused rapid venous stagnation and death. Similarly the sudden rupture of any valve or its attachments disorganises a heart much more rapidly than when the valve defect is slowly established and with it a compensatory hypertrophy of muscle takes place.

Another man with a much stenosed pulmonary arterial orifice and shrunk, but hypertrophied, right ventricle lives to be a septuagenarian, notwithstanding a universal adhesion of the visceral and parietal layers of the pericardium, *because* he has a specially large patent foramen ovale and the valvular apparatus of the left heart is sound.

If one desires to see an incontestable picture of cardiac back-pressure in a less acute degree than that produced by valvular rupture or experimental ligation, let him examine the radiogram of a tightly stenosed, buttonhole, mitral valve with dilated and unemptied left auricle and loudly accentuated pulmonic second sound. This condition may prove suddenly fatal without any indication of auricular fibrillation or any evidence of ventricular failure other than the final and unexpected syncope which terminates life.

Physicians who did not live to see the dawn and day of the modern aspect of heart disease believed that in time, sometimes in one way, sometimes in another, the driving ventricle failed to cope with the cumulative effect of blood retention or back-pressure, the failure being either gradual with the usual retrograde evidences of the triumph of stagnation over motion, or sudden and without any such manifestation. Within the memory of at least a generation only ventricular failure has been regarded as the cause of such disaster. Is there any other or better elucidation of the situation now? The very hypertrophy attending all increased difficulty in evacuating the heart, which we know is greater in some forms of valvular defect than in others, teaches the same lesson, and the failure to cope with the difficulty may arise now in one way and again in another. It may be by the gradual waning of force in a once "compensated" but later hypotonic or degenerated myocardium, by the exhaustion of the heart by some intercurrent myocardial storm, and at times apparently by inhibitory arrest or by starvation of the coronary circulation. The tachycardial heart may result in dilatation of the left ventricle with the development of well-marked mitral reflux declared by an unmistakable bruit of bicuspid incompetency, or in the small and contracted ventricle which has outrun its blood-supply, as shown by accumulated stagnation in the pulmonic circuit and venous heart and by the small empty left chambers of the organ, as in death from asphyxia or hæmorrhage.

Since, however, the question of cardiac adequacy was first mooted in the medical press, chiefly in connexion with recruiting for war, that of valvular disease as affecting the war-worthiness of the heart in the soldier has been considerably simplified for the neo-cardiologist, although it probably will be still more so for him if the war lasts a little longer.

I have stated how the adequate consideration of the subject was not entered upon either by the Oliver-Sharpey lecturer of 1911 or the Lumleian lecturer of 1917. Experience has, however, driven the new cardiologists[4] to advise a preliminary exclusion of recruits showing evidence either of regurgitant aortic disease or of mitral stenosis. If Sir James Mackenzie is in agreement with this conclusion he has changed his ground since his previous declaration of the innocuousness of mere valvular lesion in the presence of adequate ventricular force. That he has had the courage of his opinion, I know, for I have myself advised the rejection of candidates with aortic disease, both for the Army and for life insurance, whom he has considered suitable for both purposes. THE LANCET has also (July 22nd, 1916) in a leading article dealt with the responsibility involved in allowing recruits with aortic regurgitant disease to serve, and in a letter in THE LANCET (August 5th, 1916) on the soldier's heart I gave demonstrable evidence of the importance of the aortic valve in maintaining the circulation of the blood. This looked rather like forcing an open door, but some of the paradoxes of the new cardiology have made almost any discussion in cardiac matters more or less relevant, and have led to the restatement of many points once regarded as securely accepted. Even now the findings of the Report mentioned require comment. "The question," it says, "is not one of diagnosis but of prognosis. A man with stationary aortic disease may be capable, and often is capable, of far greater and more prolonged strain than is a man who with severe symptoms of the kind described has no murmur." In other words, that we are justified in gambling with the stability of a radically injured heart because it is at the moment in less parlous state than a heart inadequate from some other cause, native or acquired. This is an utterance very characteristic of the school from which it issues, which is apparently still obsessed by the disproportionate value it attaches to the

[2] Oliver-Sharpey Lectures, Brit. Med. Jour., May 19th.
[3] Edin. Med. Jour., 1879-80.
[4] Report of Medical Research Committee, No. 8, p. 7 et seq.

muscular factor in the circulation. It is some evidence, however, of a return to the appreciation of the truth in older aspects of heart disease that the new cardiologists should have conceded so much, and, as is their manner, unobtrusively, changing ground with as little acknowledgment of having abandoned a previous position as is possible. In view of the action taken in this Report, the matter raised in Sir James Mackenzie's letter of May 26th, with which I am now concerned, may be regarded as so far simplified that consideration may be limited to those cases which the authorities in question still allow to enlist and serve—namely, those showing systolic bruits at the base or apex of the heart, for the discrimination of which, as organic or functional, they consider auscultation to be a fallacious method of investigation. With a certain obvious modification, due to the difference between the exigencies of the soldier's life in war and the civilian's in peace, the considerations involved apply to both classes.

The first point to determine is whether the systolic bruit manifested in a given case is exo- or endo-cardial and what its potentialities are for affecting the action of the heart. In my letter in THE LANCET of April 14th last I stated that "many systolic bruits, transient or exo-cardial in nature, which are usually easily diagnosed and have frequently been fully appreciated, are, of course, negligible." Sir James Mackenzie asks me three questions in consequence: First, where he may learn that negligible cardiac bruits may be distinguished from those that are not negligible; second, where I can point to a single instance in which with clearness and precision directions are given for making this distinction; and third, where the principles for assessing the value of murmurs are to be found.

It is evident from these questions that he has missed the point of the statement I have quoted, as an organic endocardial bruit is never transient, except in some cases of recent endocarditis or in the presence of some degree of actual cardiac failure, when it may disappear for a time to return in the heart that has regained power, if it ever does so. His question ought to have been how organic were to be distinguished from inorganic or functional endocardial murmurs, and both these from exocardial bruits or noises. This, I stated, had frequently been pointed out and done.

That essentially inorganic non-valvulitic bruits are met with which it is impossible to distinguish while they last from valvular lesions is within the knowledge of all who have had any considerable experience of these matters. But such only occur in the presence of quite evident cardiac failure and are always systolic and apical. They never occur in the recruit or in those in ordinary health, and they may, as I have said, disappear if there is recovery of cardiac power. The physiological tricuspid leak to which Sir James Mackenzie has referred never gives bruit unless the impediment in the dextrocardial circulation is pathological, as in pulmonary embarrassment by emphysema or other cause and in the atonic hearts of some young people. The only exceptions to the apical position and systolic time of the functional endocardial bruit are the rare cases in which a pulmonary valvular diastolic bruit is met with in the presence of a well-marked mitral lesion with raised pulmonic pressure, which is surely back-pressure, and in some cases of high arterial blood pressure with a forced gape in the sigmoid valves. The inconstancy of these murmurs alone reveals their inorganic character. Such cases have, of course, no bearing upon the selection of hearts for any active occupation. The *exocardial* bruit is also systolic in time, whether at the base or apex of the heart, except when it shows the double-shuffle of a pericarditis.

Exocardial bruits and the transient endocardial bruits met with in apparently healthy and usually young subjects I need scarcely say, and I think Sir James Mackenzie will agree with me, are easily diagnosed by altering the posture of the person who manifests them and by noting the effect upon them and their relation to respiration. As such they have surely been frequently appreciated and have presented little difficulty in diagnosis by that instrument, discredited by the Report to which I have referred—namely, the stethoscope.

In the case of the soldier I maintain that *no* organic valvular lesion is negligible, although there may be degrees in the gamble with life and efficiency, if one passes some mitral reflux and direct aortic cases. To do either I hold to be unjustifiable, while to pass cases of mitral stenotic or aortic reflux lesions occurring in any degree whatever should be characterised in stronger terms. Those who would even think of passing such cases are only likely to be found among the so-called neo-cardiologists, and a chastened experience appears to be in the course of enlightening even them, if we may judge by some of the findings of the Research Committee's Report.

With the civilian the case is not quite the same as with the soldier. For the purposes of life insurance there are few organic valvular lesions which should be passed except in some cases for short periods and then with the risk recognised. But, as we all know, the civilian who is not called upon for strenuous effort may occasionally carry an organic valvular lesion through a long and not inactive life. So far as my own experience goes, the aortic orifice is always sound in such cases and the lesion mitral and reflux. Rare cases, such as that of the malformed heart I referred to, which survived to old age, are quite exceptional and explicable by anatomical conditions, which only emphasise the importance of the valvular factor in heart disease, and the necessity for reckoning with it in prognosis. The value, moreover, of the careful study of the timbre or note of an organic valvular murmur in a given case in which a standard of its audibility and pitch has been established may provide a gauge of the power of the chamber or chambers of the heart producing it. This point was early impressed upon me, and I have referred to it in various papers and publications. It has also been noted by others.

I hope I have now shown that the bruits I characterised in my "oracular" utterance in THE LANCET of April 14th as negligible and as having frequently been appreciated were exocardial bruits and those functional endocardial bruits which disappear or are markedly modified on exertion or change of posture and which are at times abolished by deep respiration. Sir James Mackenzie evidently desired to learn the criteria for the full appreciation of organic endocardial or valvulitic bruits. That is another matter, but may approximately be done, as many writers have pointed out. Perhaps among recent authors the late Sir William Broadbent dealt with the point most fully, although it has not been overlooked by others. One of the best writers on the auscultation of the heart was Peter Mere Latham, whose work on heart disease, published by the New Sydenham Society, with an introductory memoir by that master of pure English, Sir Thomas Watson, will always be worthy of perusal. The appreciation of organic murmurs can, however, only be approximately attained by attention to such considerations as their site, the character of the pulse, the changes in one or more chambers of the heart, and the auscultatory evidence, or absence of evidence, of tension in the pulmonic circuit. With these interesting topics I am not at present concerned, although I have incidentally had to touch upon them in maintaining the importance of the valvular factor in heart disease against exponents of the new cardiology. I am, Sir, yours faithfully,

ALEXANDER MORISON.

Upper Berkeley-street, W., June 2nd, 1917.

AURICULAR FLUTTER DISCOVERED BY RADIOSCOPY.

To the Editor of THE LANCET.

SIR,—I anticipated that one or more of our English radiologists would have made some remarks *re* the annotation in THE LANCET of May 26th concerning auricular flutter as seen by the radioscopic screen. It is already well known that this phenomenon may be clearly recognised under the rays and the proportion 1 : 3 or 1 : 2 easily determined, and this is taught in continental text-books on radiology, and in particular in those written by our French confrères. In October, 1915, a young soldier was brought into the X ray room at the East Sussex Hospital, Hastings, who appeared very nervous of the rays. The heart showed an obvious right auricular flutter with a rhythm of 3 : 1, which disappeared after 15 minutes, and was quite obvious to those standing round. Although I examined him on several occasions afterwards I never caught it again. So far as I know, this is the first time that a neurotic or functional auricular tachycardia has been noticed. The ordinary form of heart-block in the aged and the disturbance of rhythm produced by extrasystoles are generally clearly seen on radioscopic examination.—I am, Sir, yours faithfully,

WALKER OVEREND, M.A., M.D. Oxon.,
Chief Assistant, X Ray Department, St. Bartholomew's Hospital, and Honorary Radiologist, East Sussex Hospital.

St. Leonards-on-Sea, June 6th, 1917.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed.

Major A. V. Honman, Australian A.M.C.

Previously reported Missing, believed Drowned, now reported Drowned.

Capt. G. C. B. Hawes, R.A.M.C. (see THE LANCET, April 21st, 1917, p. 629).

Lieut. J. Naylor, R.A.M.C. (see THE LANCET, May 12th, 1917, p. 739).

Wounded.

Capt. S. S. Greaves, R.A.M.C.
Capt. B. C. Tennent, R.A.M.C.
Capt. F. P. Fisher, R.A.M.C., attached K.R.R.C.
Capt. A. G. M. Middleton, R.A.M.C.
Capt. A. H. Smith, R.A.M.C.
Col. F. S. L. Ford, C.M.G., Canadian A.M.C.
Lt.-Col. C. P. Templeton, Canadian A.M.C.
Capt. E. D. Gairdner, R.A.M.C., attached Rifle Brigade.
Lieut. F. G. Hack, R.A.M.C., attached Rifle Brigade.
Lt.-Col. A. E. Hodder, R.A.M.C.
Capt. R. W. Smith, R.A.M.C., attached Hussars.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who are reported to have fallen during the war :—

Second Lieut. F. M. Sutcliffe, London Regiment, killed in action, was the third son of the late Dr. J. Sutcliffe, of Clapham, Surrey.

Second Lieut. R. M. Hamilton, Cheshire Regiment, accidentally killed abroad, was the fifth son of Dr. Hamilton, late of Chester.

Second Lieut. (acting Capt.) D. W. Tonking, Duke of Cornwall's Light Infantry, died of wounds, was the son of Dr. J. H. Tonking, of Camborne, Cornwall.

Major R. Bolster, M.C., Royal Artillery, killed in action, elder son of the late Surgeon-General T. Bolster, R.N.

MENTIONED IN DESPATCHES.

The following are mentioned in a despatch, dated June 12th, 1917, dealing with operations near Basra in April, 1915 :—

Lieut. N. S. Jatar, I.M.S.; Temp. Lieut. W. B. Patel, I.M.S.; Capt. A. R. Thomas, I.M.S.; Asst.-Surg. (4th class) M. J. Nicholas, I.S.M.D.; Senr. Sub-Asst.-Surg. (1st class) Azhar Hussain, I.S.M.D.

FOREIGN DECORATION.

French.

Médaille d'Honneur des Epidémies en Argent.—Temp. Capt. (temp. Maj.) A. G. Whitehorne-Cole, R.A.M.C.

THE ARTIST AT THE FRONT.

Part I. of Vol. II. of Mr. Muirhead Bone's drawings, issued from the offices of *Country Life* and Messrs. George Newnes under the title of "The Western Front," has the same high standard of imagination and technique as its predecessors. The larger proportion of the etchings are coloured, with very pleasing results. It will be noticed that Mr. Muirhead Bone, after his visit to the munition works and the Grand Fleet, has returned to France, as the current issue of "The Western Front" is devoted to the battle of Arras, with illustrations of Bapaume, Peronne, Thiepval, and other points of interest in the great advance. The prefatorial description of the battle of Arras forms one of the finest stories of a battle that we have ever read even in these days of journalism through the medium of pens of acknowledged distinction dealing with unrivalled opportunities. We cannot attempt to single out for particular notice any of the pictures.

HOSPITAL FOR LIMBLESS SOLDIERS.—Princess Louise has recently opened Erskine House, near Glasgow, as a hospital for limbless soldiers with accommodation for 400 patients. Some 450 men have been already provided with limbs manufactured by Scottish labour. About £200,000 has been raised for equipment and endowment of the hospital.

BATTALION SANITARY STANDING ORDERS.

THE article which follows has been contributed by Captain H. W. BAYLY, R.A.M.C. (T.), M.R.C.S., L.R.C.P. Lond. :—

The regular officers of the Royal Army Medical Corps receive a thorough and practical education in sanitation and hygiene, but circumstances do not usually permit Territorial or temporary medical officers to acquire a similar knowledge and experience. Many general practitioners or recently qualified men join the Royal Army Medical Corps as temporary officers and become attached to battalions with but a hazy idea as to the scope of their duties and with a very superficial knowledge of the contents of the admirable handbooks on the subjects of sanitation and hygiene provided and issued by the Army medical authorities.

Sanitary Duties of Battalion Medical Officers.

The temporary Royal Army Medical Corps officer often leaves his practice with the idea that sanitation is the work of a specialist and that his army duties will consist of attending to regimental sick and dressing wounded under fire. He usually quite fails to realise that his most valuable and important work may lie in the path of preventive medicine.

It is of the utmost importance that he should realise his position as the last link in the wonderful chain of practical science and administrative organisation between the private soldier and the Director-General of the Army Medical Service. Headquarters do everything possible to ensure efficient sanitation of the different sectors, and the most up-to-date orders are issued supplementing the excellent orders and regulations contained in the handbooks; but the final responsibility very largely remains still with the battalion medical officer. He alone is in a position to see that these orders and regulations for the health of the men and the sanitation of the area occupied by them are carried out. He alone can obtain their active coöperation in this work.

However perfect such orders and regulations may be, they will avail nothing if the battalion medical officer fails to see that they are carried out. Only by the ceaseless care and energy of the battalion medical officer can efficient sanitation be enforced and maintained. Constant disappointment, frequent rebuffs, must not discourage him. Although he knows that as soon as he is beginning to get things straight his battalion will be moved somewhere else, still, he must remember that although his particular unit will not benefit from his labours the work is not lost, and some unit of the B.E.F. will benefit. He must never allow popularity to come for one moment before duty, and it is not always easy, especially for a young man, to insist on the necessity of some work which may not appear as a necessity to a non-medical mind burdened with responsibility of a purely military nature.

To most non-commissioned officers and men Army Orders, or even Divisional Orders, are remote from their life as a unit, and to them their battalion is their world. It therefore appears advisable that every battalion should have its own standing orders dealing with sanitation and hygiene. Such orders must be very simple and explicit or they will be evaded, and the excuse made that they were misunderstood, or ignorance will be pleaded. Lectures on sanitation must be given by the medical officer of the battalion by companies, in which the standing orders are gone through item by item, and the "why" and "wherefore" explained. The soldier must be made to see that the Standing Sanitary Orders are drawn up for his own good, and that they are not just the arbitrary and annoying whim of a faddy medical officer.

As battalion medical officers fall sick or become casualties their places are taken by others, and continuity in sanitary methods is liable to be interfered with; thus Battalion Standing Sanitary Orders would help in assisting continuity. Divisional orders dealing with questions of sanitation accumulate rapidly, and it takes some considerable time for a medical officer to master the voluminous file of old orders; also, especially during an attack, or if the medical officer and sick sergeant become casualties, the file of orders may be destroyed or lost, and a new medical officer would find the Battalion Standing Sanitary Orders a great help.

I drew up the following standing sanitary orders for rest camp, on the march, and trenches, and the commanding officer of the battalion to which I had the honour of being attached was good enough to have them published in Battalion Orders after they had received the sanction of my

Assistant Director of Medical Services. They are only an extract, in simple language that can be understood by the men, of the many admirable orders, rules, and regulations contained in the Army publications and orders. They are based on practical front-line battalion experience, and my hope is that they may serve as a useful guide to battalion medical officers who are new to their work. Doubtless they can be advantageously modified to meet varied circumstances and environments, but I think that if somewhat similar Standing Sanitary Orders were enforced in every battalion they would assist in the carrying out of the wishes of the higher commands as expressed in Army Corps and Divisional Orders.

BATTALION STANDING SANITARY ORDERS.

I.—REST CAMP.

A. *Conservancy.*

1. *Latrines.*—(*a*) *Type: Temporary.* Buckets or tins with post and rail seat. Front of tin to be 4 in. behind bar, with a tin gutter 8 in. broad leading from back of bar into tin. *Permanent.* Buckets with closed-in seats and with covers for holes. Where permanent latrines of other types have been constructed by previous units they may be used subject to the sanction of the medical officer. (*b*) *Disinfection:* Buckets or tins to be disinfected with chloride of lime. (*c*) Buckets or tins to be emptied at 8 A.M. and 3 P.M. and contents burned in closed destructor where possible, but otherwise buried at least 100 yards from any house, hut, tent, or bivouac. (*d*) Every man to cover excreta with dry earth (or sawdust where possible) after using latrine. (*e*) Men are strictly forbidden to relieve themselves except in latrines. (*f*) Latrine seat must be washed daily with cresol solution.

2. *Urinals.*—(*a*) Urine pits to be constructed according to orders of the medical officer. (*b*) One urine bucket or tin to be placed outside each hut or billet of every platoon for use during night only. (*c*) Urine tins to contain 3 oz. cresol solution. (*d*) Tins to be emptied into urine pits at 8 A.M. daily. (*e*) Men are strictly forbidden to urinate except into the tins, buckets, or urine pits provided.

3. *Incinerators.*—(*a*) *Type:* Where possible, closed incinerators of the Horsfall pattern should be built by the pioneers of the battalion for the destruction of excreta. They may be built of tins full of earth, puddled clay, and corrugated iron sheeting. Where excreta are buried, open incinerators may be used for the burning of rubbish. (*b*) One incinerator per company is required and one for headquarters. (*c*) Incinerators should be lit at 8 A.M. and kept well burning all day and fully charged before leaving duty at 4 P.M.

B. *Disposal of Refuse.*

1. *Food and hut refuse.*—(*a*) All remains of food, empty tins, rubbish, &c., to be collected immediately after each meal and placed in the receptacle provided. The platoon sergeant will be responsible for the collection of refuse. (*b*) The refuse receptacles will be emptied and contents removed by the sanitary squad at 9 A.M. and 2 P.M. and burned in the incinerator.

2. *Cook-house refuse.*—(*a*) A receptacle to be provided adjacent to each cook-house for the collection of "pig-tub" refuse. (*b*) Contents to be removed daily by local contract or to be burnt in the incinerator.

3. *Sullage water from cook-house.*—(*a*) A sullage pit of the type recommended by the medical officer to be made as near each cook-house as practicable. (*b*) The hay or straw filter-layer to be burned daily in the incinerator. (*c*) The sand, gravel, or ash filter-layer to be changed once a week and the fouled material that is removed buried. (*d*) The sullage pit to be used for greasy water only.

4. *Horse-dung.*—All horse-dung to be removed daily, either (*a*) by arrangement with local farmers; (*b*) by burning in the incinerator; or (*c*) by burial in a pit or by being covered with a 6 in. layer of fresh earth.

C. *Water and Food.*

1. *Water* (drinking and cooking).—Men are strictly forbidden to drink any water, or fill their water-bottles with any water, or use any water for cooking purposes, except that obtained from the water-carts, unless by permission of the medical officer as published in orders.

2. *Food.*—(*a*) Rations will be issued by non-commissioned officer or senior soldier in charge of each section, only sufficient rations for each meal being issued at one time. (*b*) All unopened tins of food to be kept in a cool place until issued. (*c*) All bread, biscuit, cheese, sugar, &c., to be kept in a dust- and fly-proof receptacle until issued. (*d*) Meat (fresh) to be kept in a dust- and fly-proof safe until issued. (*e*) Tins only to be opened immediately before consumption of contents. (*f*) Any unconsumed food reserved for future consumption, or any food, chocolate, sweets, &c., contained in a parcel from home, to be placed in a dust- and fly-proof receptacle provided or in *closed* mess-tins.

D. *Fly Prevention and Destruction.*

(*a*) All refuse left by previous units must be collected and burned in the incinerator. (*b*) All foul ground from which refuse has been removed must be sprayed with cresol solution or with a vermorel spray. (*c*) All wooden or paved flooring must be brushed out daily and washed once a week with cresol solution.

E. *Personal Cleanliness.*

1. *Ablution places.*—(*a*) To be washed down daily. (*b*) The soapy water to be directed by open drains into two pits in series separated by a trap. The first or cleansing pit to contain chloride of lime and the effluent to be run off from 9 in. below the surface of the scum into the second or soakage pit. (*c*) The scum to be skimmed off the cleansing pit at least once a week and fresh chloride of lime added.

2. *Baths.*—(*a*) *Permanent:* When possible every man will have at least one hot bath per week. Platoon sergeants will be responsible that the bath rolls of their platoons are correctly kept. (*b*) *Temporary:* Where permanent baths are not provided a temporary bathing place will be, if possible, established and use made of the local tubs and coppers that are available. This bathing place must be trenched and drained into two large sullage pits in series, as with ablution places. (*c*) *Bathing parades:* In rivers, streams, &c. Platoon sergeants will be responsible that the rolls for such parades are correctly kept.

3. *Washing and sterilisation of underclothes and blankets.*—(*a*) Shirts, vests, and pants should be washed at least once a fortnight; socks must be washed once a week. (*b*) These articles should, if possible, be sterilised in a steam steriliser once in six weeks. (*c*) In fine weather blankets must be exposed to sun and wind for at least one hour daily.

F. *Ventilation.*

1. *Billets.*—All windows to be kept wide open day and night during summer months except on weather side during a rain-storm. During winter months windows to be kept wide open for at least one hour daily.

2. *Huts.*—(*a*) Windows and ventilators to be kept open day and night. (*b*) During windy weather in winter, if the hut contains windows on two sides, those on the weather side may be closed. (*c*) If the hut has loose tarpaulin sides these will be raised for at least one hour per day unless there is heavy rain and wind. (*d*) Windows or ventilators must not be blocked with sacking or other obstacle to free ventilation.

3. *Tents.*—(*a*) Walls of tent to be rolled up during day when tent is unoccupied except during heavy rain or wind. (*b*) During fine warm weather tent door to be kept open at night.

II.—ON THE MARCH.

A. *Latrines.*—(*a*) At every place where the battalion stops for an hour or longer shallow trench latrines of the 1 × 2 × 3 type should be dug by the sanitary squad in the proportion of one for every company and one for headquarters. Latrines must be filled in before proceeding. (*b*) During short halts or when a man has obtained permission to fall out on the march to relieve himself, he should dig a small hole with his entrenching tool, and after easing himself should fill in the hole with earth.

B. *Urination.*—(*a*) At every place where the battalion stops for an hour or longer an open urine pit 3′ × 3′ × 3′ should be dug out and filled in before proceeding. (*b*) During short halts or when a man has obtained permission to fall out to pass water he should be careful not to urinate within 50 yards of any pump, well, stream, reservoir, or pond. (*c*) If the battalion falls out in a village the men should make use of the public urinals provided by the military or local civilian authorities.

C. *Refuse.*—All remains of food, empty tins, &c., must be collected and buried in the urine pits and latrine trenches before proceeding after a rest for meals.

D. *Water.*—(*a*) No water to be drunk under any circumstances whatever except from the water-bottles carried. (*b*) No water to be drunk without the permission of an officer. (*c*) No water, other than water-cart water, to be used for cooking unless the permission of the medical officer has first been obtained.

III.—IN THE TRENCHES.

A. *Conservancy.*

1. *Latrines.*—(*a*) *Type:* Tins with bar and gutter as in temporary rest camp. (*b*) *Disinfection:* As in rest camp. (*c*) Tins to be emptied into a shell hole, or other pit, at least 20 yards from trench, and covered with 1 foot of earth. (*d*) Latrine tins to be emptied and contents buried once every day and during hours of darkness only. (*e*) Every man to cover excreta with dry earth after using latrine. (*f*) Men to be strictly forbidden to relieve themselves in unused communication trenches or anywhere except in the latrines provided. (*g*) Latrine seats must be washed daily with cresol solution. (*h*) Occupied trenches to be provided with latrine accommodation every 300 yards. Communication trenches to be provided with latrine accommodation every 600 yards.

2. *Urinals.*—(*a*) Only water-tight tins to be used. (*b*) Tins to be raised up so that top level is 2 feet above ground level. (*c*) Tins to be disinfected with 3 oz. cresol solution. (*d*) Tins emptied as with latrines. (*e*) Accommodation as with latrines. (*f*) Men strictly forbidden to urinate in unused trenches, or anywhere except in the tins provided.

B. *Disposal of Refuse.*

(*a*) All refuse, empty tins, remains of food, &c., to be collected after each meal and placed in sandbag provided. Refuse must *not* be thrown over parapet or parados. (*b*) Refuse bags to be buried every night. (*c*) Any rubbish heap or foul ground that smells or attracts flies must be sprayed with creosol solution or a vermorel spray, and covered with fresh earth. (*d*) All refuse of any kind left littering the parapet, parados, or ground within 20 yards of a trench by previous occupiers of the sector must be removed and buried as soon as reasonably possible. (*e*) All greasy or soapy water must be poured into a hole and covered with fresh earth.

C. *Water and Food.*

1. *Water.*—(*a*) Men are strictly forbidden to drink any water or to fill their water-bottles with any water, except that supplied for their use by tank, pipe, or water-cart. (*b*) Well or pump water from adjacent houses must not be used for cooking unless the permission of the medical officer has been first obtained.

2. *Food.*—(*a*) Tins only to be opened immediately before consumption. (*b*) Any unconsumed food reserved for future consumption to be placed in a dust- and fly-proof receptacle, such as a closed mess-tin.

D. *Corpses.*

If, owing to position or decomposition, removal for burial is impracticable, the body, if within 30 yards of trench, must as soon as is reasonably possible be covered with 1 foot of earth or soaked with petroleum and burned.

ADDENDUM TO STANDING SANITARY ORDERS.

IV.—DUTIES OF SANITARY PERSONNEL.

1. The sanitary squad will be under the orders of the medical officer.

2. Routine hours of work in rest camp shall be 8 A.M. to noon and 2 P.M. to 4 P.M.

3. During the hours of work no man may absent himself from his duties.

4. Members of the sanitary squad will be excused all parades and fatigues with the exception when in trenches, of ration, water, and trench cleaning fatigues.

5. Two sanitary men alternately of each company will attend roll-call daily.

6. When on the march, in trenches, or on any special occasion (such as on arrival at, or departure from, a camp) the sanitary squad may be required to work before 8 A.M. or after 4 P.M.

7. Members of the sanitary squad will act as sanitary police and will report to the sanitary corporal, who will report to the medical officer, who will report to the officer commanding company every or any breach in the Battalion Sanitary Standing Orders, and they shall have authority to demand the name and number of any offender.

8. The medical officer will make a sanitary inspection of the camp or billets or trenches daily and instruct the sanitary corporal as to the work to be done.

9. The medical officer will give special lectures while in rest camp on sanitation to the sanitary squad at least once a month.

10. The sanitary corporal will be responsible to the medical officer for the carrying out of the Sanitary Standing Orders and the additional orders of the medical officer.

11. The medical officer will give occasional lectures on sanitation when in rest camp to the officers and men of the battalion, explaining the Standing Orders.

12. The duties of the sanitary squad shall consist of: (*a*) Preparing latrines, urine pits and tins, sullage pits, and refuse pits. (*b*) Attending to the same. (*c*. Collecting and burning all refuse and rubbish from the receptacles provided. (*d*) Disinfection of foul ground. (*e*) Reporting offences against Sanitary Orders.

Need of Constant Inspection.

In conclusion, I venture to insist on the urgent necessity of the battalion medical officer satisfying himself by daily inspection that his orders and the Battalion Standing Sanitary Orders are being carried out. It is quite useless giving orders if the orders are not backed up by frequent inspection. Nothing must be skipped, and it is as important to visit every trench latrine and dug-out as to make the daily round of billets and sanitary areas when behind the lines. The medical officer's daily visit to front-line trenches shows that he really believes in the importance of his teaching and helps to establish the friendly coöperation of the men. Unused communication trenches are apt to become insanitary if a watchful eye is not kept on them.

It is quite fallacious to think that a battalion medical officer has a lazy time except during a "push." On the contrary, if he performs all his duties efficiently he is busily employed nearly all his day, and especially so in rest camp, where his lectures on sanitation and first aid to officers, non-commissioned officers, and men, as well as to his own particular charges, the sanitary squad and stretcher-bearers, will be part of his routine week-day work. If a battalion medical officer complains that he is bored and has nothing to do, one can be very certain that he has failed to realise the scope of his duties and is not an efficient battalion medical officer.

RED CROSS GIFTS.—A menu card with drawings of penguins on the back by Captain Evans, of the *Broke*, has realised £1000 for the Red Cross. Mr. Walter Morrison has given a donation of £10,000 to the City of London Branch of the British Red Cross Society. £11,650 have been given by the British Farmers' Red Cross Fund for the purpose of meeting the expenses of the two hospital trains presented to the Red Cross by the Flour Millers of the United Kingdom.

URBAN VITAL STATISTICS.

(Week ended June 9th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 12·7, against rates steadily declining from 18·5 to 12·7 per 1000 in the eight preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 12·1, or 0·4 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 4·5 in Hornsey, 5·3 in Newport (Mon.), and 5·4 in Northampton to 20·4 in Walsall, 21·0 in Gloucester, and 23·0 in Sunderland. The principal epidemic diseases caused 348 deaths, which corresponded to an annual rate of 1·1 per 1000, and included 208 from measles, 61 from whooping-cough, 45 from infantile diarrhœa, 22 from diphtheria, and 6 each from enteric fever and scarlet fever. The deaths from measles were 37 fewer than in the previous week, and caused the highest annual death-rates of 3·3 in West Hartlepool and in South Shields, 3·6 in Sunderland, 3·9 in West Bromwich, and 4·5 in Middlesbrough. The 636 cases of scarlet fever and 1082 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 10 and 21 above the numbers remaining at the end of the previous week. Of the 4116 deaths from all causes in the 96 towns, 134 resulted from violence. The causes of 24 deaths were uncertified, of which 3 were recorded in Birmingham and in Sunderland, and 2 each in Stoke-on-Trent, South Shields, and Gateshead.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 14·9, against rates declining from 17·0 to 16·0 per 1000 in the three preceding weeks. The 325 deaths in Glasgow corresponded to an annual rate of 15·2 per 1000, and included 37 from whooping-cough, 32 from measles, 3 each from diphtheria and infantile diarrhœa, and 1 from scarlet fever. The 110 deaths in Edinburgh were equal to a rate of 17·3 per 1000, and included 7 from whooping-cough, 6 from measles, and 1 from infantile diarrhœa.

Irish Towns.—The 141 deaths recorded in Dublin were equal to an annual rate of 18·4 per 1000, and included 3 from measles, and 2 each from whooping-cough and infantile diarrhœa. The 101 deaths in Belfast corresponded to a rate of 13·4 per 1000, and included 2 from whooping-cough, and 1 each from enteric fever, measles, and infantile diarrhœa.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

COMMITTEE FOR THE INVESTIGATION OF ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR THE MONTHS ENDING

Dec. 31st, 1916.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash.	Soluble matter. Loss on ignition.	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.										
Leicester	50	0·10	4·00	4·38	1·55	2·29	12·31	1·64	0·30	0·17
London—										
Meteorological Office	58	0·13	2·99	8·08	3·48	3·48	18·16	1·90	0·70	0·02
Embankment Gardens	39	1·28	3·53	6·74	1·47	3·19	16·20	1·79	0·68	0·05
Finsbury Park ...	65	0·05	0·54	1·17	2·73	4·66	9·15	3·17	0·64	0·05
Ravenscourt Park	62	0·34	2·40	5·24	3·98	8·31	20·26	5·49	0·60	0·09
Southwark Park	67	0·43	4·49	9·37	5·88	9·29	29·49	5·70	0·92	0·08
Golden Lane ...	60	0·12	2·93	3·84	1·69	5·31	13·89	2·42	0·94	0·18
Manchester—										
Queen's Park ...	73	—	—	—	—	—	18·00	—	—	—
School of Technology	80	—	—	—	—	—	21·00	—	—	—
Newcastle-on-Tyne	95	0·37	5·13	11·59	2·08	4·17	23·34	2·62	0·50	0·11
York	47	—	—	—	2·24	3·74	—	2·03	0·4	0·03
SCOTLAND.										
Coatbridge	72	0·25	2·97	6·33	1·34	1·89	12·78	1·40	0·31	0·13
Greenock	151	0·36	2·47	3·24	2·26	5·44	13·78	2·55	0·69	0·20

Jan. 31st, 1917.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash.	Soluble matter. Loss on ignition.	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.										
Leicester...	45	0·08	3·35	5 70	1·03	2·43	12·59	1·31	0·48	0·14
London—										
Meteorological Office...	34	0·10	3·09	3·82	2·72	2·04	11·77	1·10	0·91	0·01
Embankment Gardens	26	0·11	1·01	1·68	1·12	2·11	6·02	1·30	0·39	0·03
Finsbury Park ...	31	0·05	0·98	2·05	0·81	1·88	5·76	1·04	0·29	0·02
Ravenscourt Park	31	0·13	1·11	2·78	1·18	2·40	7·59	1·49	0·33	0·04
Wandsworth Com.	26	0·02	0·66	2·46	0·93	1·79	5·86	0·91	0·40	0·02
Golden Lane ...	28	0·04	1·51	2·05	1·11	2·99	7·70	1·37	0·66	0·10
Malvern	33	—	0·33	0·72	0·64	1·98	3·68	0·74	0·25	0 01
Manchester—										
Queen's Park ...	44	—	—	10·20	—	—	13·30	—	—	—
School of Technology	49	—	—	14·02	—	—	18·40	—	—	—
St. Helens	55	0·21	4·51	2·06	0·21	11·34	18·31	3·80	1·08	0·16
Newcastle-on-Tyne	82	0·48	5·63	17·59	3·75	5 40	32 86	2·80	1·56	0·15
York...	77	0·12	0·97	1·24	4·27	5·56	12·16	3·00	1·09	0·05
SCOTLAND.										
Coatbridge	63	0·20	1·59	3·67	2·14	2·93	10·53	1·93	0·39	0·15

There are no returns in these tables from Exeter, the work having been discontinued owing to the war, nor from the Metropolitan Stations, Victoria Park (December and January) and Wandsworth Common (December), on account of frost.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) one gramme per sq. metre; (*d*) 1/1000 millimetre of rainfall.

The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

Deputy Surg.-Gen. P. B. Handyside to be Surgeon-General, and Fleet-Surg. W. Bett, M.V.O., to be Deputy Surgeon-General.

To be Temporary Surgeons: J. E. Jackson, J. E. G. McGibbon.

ARMY HEADQUARTERS STAFF: MEDICAL BRANCH.

To be Temporary Directors, Medical Services in India: Surg.-Gen. J. G. MacNeece, C.B., Army Medical Service; Surg.-Gen. T. J. O'Donnell, C.B., D.S.O., Army Medical Service.

ARMY MEDICAL SERVICE.

Col. A. E. Ross, C.M.G., Canadian A.M.C., to be Deputy Director of Medical Services, vice Col. G. L. Foster, C.B., Canadian A.M.C.

Lieut.-Col. F. S. L. Ford, C.M.G., Canadian A.M.C., to be Assistant Director of Medical Services, and to be temporary Colonel whilst so employed, vice Col. A. E. Ross, C.M.G., Canadian A.M.C.

Capt. G. H. R. Gibson, Canadian A.M.C., vice Lieut. Col. F. S. L. Ford, C.M.G., Canadian A.M.C., and Lieut.-Col. C. P. Templeton, Canadian A.M.C., to be Deputy Assistant Directors of Medical Services.

Lieut.-Col. Cecil A. Lane, R.A.M.C., from Supernumerary List, to be Colonel.

ROYAL ARMY MEDICAL CORPS.

Major D. P. Kappele, Canadian A.M.C., to be temporary Lieutenant-Colonel whilst holding appointment as Officer Commanding, Canadian Cavalry Field Ambulance.

J. Macpherson to be temporary Honorary Lieutenant-Colonel.

Temp. Hon. Capt. C. McNeil to be temporary Honorary Major whilst serving with the Scottish Red Cross Society.

Capt. H. Meggitt to be Major.

To be temporary Majors: Temp. Capts. A. E. H. Bennett, R. H. MacDonald, C. J. Marsh, W. H. Whitehouse, G. G. Greer.

Lieut. W. Brander is restored to the Establishment.

Major (temp. Lieut.-Col.) R. Corfe relinquishes his temporary rank on ceasing to command a field ambulance.

Major J. R. Williams relinquishes his commission on account of ill-health, and is granted permission to retain his rank and wear the prescribed uniform.

Capt. G. D. Freer relinquishes his commission on account of ill-health.

Temp. Capt. A. R. Taylor, Canadian A.M.C., resigns his temporary commission.

Temp. Capt. J. Brereton-Barry relinquishes his commission on account of ill-health.

SPECIAL RESERVE OF OFFICERS.

Capt. (temp. Major) W. M. Parham relinquishes his temporary rank on alteration in posting.

Lieutenants to be Captains: P. N. Cook, H. M. C. Macaulay.

To be Lieutenants: A. D. Gorman (from Glasgow University Contingent O.T.C.), A. H. Boon, R. McGregor.

TERRITORIAL FORCE.

Captains to be temporary Majors: D. Douglas-Crawford, J. Hay.

Lieutenants to be Captains: L. A. Williams, M. B. G. Sinnette, H. Vallow.

Temp. Capt. J. J. O'Neill relinquishes his commission.

TERRITORIAL DECORATION.

The King has conferred the Territorial Decoration upon the undermentioned officers of the Territorial Force, R.A.M.C.: Major A. Butler, Major A. C. Hartley, Lieut.-Col. W. G. Richardson, Major (temp. Lieut.-Col.) G. A. Troup, Major (temp. Lieut.-Col.) A. W. Anderson, Major R. B. Sidebottom (attached Cheshire Regiment), Major R. Brodie (attached Seaforth Highlanders), and Major Peter Paget (attached East Kent Regiment).

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

In the May number of the *Journal of the Royal Army Medical Corps* Colonel Andrew Fullerton, C.M.G., has a useful article on Injuries of the Bladder and Urethra in War, these lesions having received very little attention on the part of writers on military surgery during the present war; and Colonel Cuthbert S. Wallace, C.M.G., discusses the treatment of Gas Gangrene as seen at the Casualty Clearing Stations. While it is true that the disease is not so dangerous now as it used to be, because of the universal opening-up of wounds, the amount of trouble that it entails, and the amount of disturbance that it is necessary to inflict on a grievously wounded patient, makes the author of the communication long for some remedy other than surgical interference. With the object of showing the frequency and nature of the diseases of the ear, throat and nose met with in a T.F. General Hospital, Captain A. Brown Kelly contributes an article on statistics of the first 1000 of these diseases treated in the Fourth General Hospital, Stobhill, Glasgow, and Lieutenant-Colonel C. M. Wenyon and Captain F. W. O'Connor continue their joint inquiry into problems affecting the spread and incidence of intestinal protozoal infections of British troops and natives in Egypt.

THE LATE DR. C. E. TODD, OF ADELAIDE.—Charles Edward Todd, M.R.C.S. Eng., M.D. Brux., whose death at Adelaide is announced, was son of the late Sir Charles Todd, F.R.S., and received his medical education at St. George's Hospital, qualifying in 1882. Going out to Australia, he became surgeon to the Adelaide Hospital and to the South Australian Police Department, and was one of the best known operators in Australia. From 1901-2 he was president of the South Australian branch of the British Medical Association, and he held a commission as justice of the peace.

Medical News.

UNIVERSITY OF LONDON. — The Appointments Board was constituted by the Senate in 1909 for the purpose of assisting graduates and students of the University to secure appointments. About 2500 graduates and students have up to the present taken advantage of the Board's organisation, and a considerable proportion of them have secured appointments through its agency. The war has naturally impeded its general work, though not its usefulness. It is believed that after the war there will be much greater opportunities of successful work. Special efforts will be made to meet the employment needs of students and graduates who have served in the Army and Navy, and who may be temporarily displaced. All such graduates are invited to send their names to the secretary at once. The offices are at the University, South Kensington, S.W. 7.

THE LOCAL GOVERNMENT BOARD OF IRELAND AND DOCTORS OF MILITARY AGE.—The legality of the attitude of the Local Government Board, Ireland, in refusing to sanction the appointment to Poor-law offices of medical men of military age will shortly come before the courts for decision. A conditional order of mandamus was granted recently by the King's Bench on behalf of the Rathdown guardians, directing the Local Government Board to exercise their discretionary power of sanctioning the appointment of Dr. D. Boland to the position of medical officer. Sanction had been refused on the ground that the doctor was of military age, and the guardians submitted that there was no power of refusal when a man was qualified for the appointment. Several other boards are awaiting the decision in this case.

CENTENARIAN.—The King has sent a letter of congratulation to Mrs. Clutten, of Bungay, Suffolk, who has celebrated the 100th anniversary of her birthday.

THE office of the Assistant Director of Medical Service for the London Area of the Overseas Military Forces of Canada has been changed from 76, Strand, W.C. 2, to 13, Berners-street, W. 1.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—The annual election of honorary officers and Council of the Royal College of Surgeons in Ireland took place on June 4th. There was no change either in the officers or in the members of Council. Lieutenant-Colonel William Taylor therefore now enters on his second year of office as President.

THE DENTISTS' REGISTER.—The official register for 1917 contains the names of 5512 dentists, of whom 11 are on the colonial and 16 on the foreign list. Of the 5485 United Kingdom dentists, 4134 hold licences in dental surgery, and 1351 are registered on their own declaration of being in bona-fide practice of dentistry. Of the former, 462 have additional surgical or medical qualifications, of the latter 7. The number added by registration during the year 1916 was 195, 8 were restored to the Register, and 144 were removed—120 on evidence of death, 0 on ceasing to practise, 23 under Section XII., and 1 under Section XIII. of the Dentists Act, 1878.

DEATH OF THE INVENTOR OF THE SIMPSON LAMP.—The death is announced on Tuesday, June 5th, of Mr. William Speirs Simpson, civil engineer, the inventor of the lamp which bears his name. The applications of this lamp in therapeutic practice were described in THE LANCET of Jan. 8th, 1916, p. 76, Jan. 29th, 1916, p. 240, Feb. 19th, 1916, p. 405, and March 4th, 1916, p. 508. The observations seem to prove that this lamp is not capable of producing penetrative rays but intensely actinic rays, which effect a marked destructive influence on bacteria. The poles of this arc lamp consist of wolframite, a tungsten compound, and the rays so produced are much more powerful than those given by the electrodes of the original Finsen lamp.

DONATIONS AND BEQUESTS.—Mr. and Mrs. G. W. Hayes, of Chester, have given £17,000 to Chester Infirmary for the purpose of endowing a ward in memory of their son, who was killed in action.—By the will of the late Mr. James Bruce, D.L., J.P., of Thorndale, Belfast, the testator left £1000 each to the Belfast Royal Hospital and the Society for Providing Nurses for the Sick Poor, Belfast; £500 each to the Belfast Nurses' Home and Training School, the Belfast Maternity Hospital, the Belfast Hospital for Sick Children, and the Belfast Consumption Hospital.—Miss M. E. P. Elliott, of Devonport, has bequeathed £2000 to Dr. Hingston's Convalescent Home at Devonport, and £500 to Dr. Hingston's Deaf and Dumb Institution, £1000 to the Plymouth Eye Infirmary, and £300 to the South Devon and East Cornwall Hospital, Plymouth.

HOSPITAL SATURDAY IN BELFAST.—The collection on Saturday, June 2nd, for the Royal Victoria Hospital, Belfast, has already realised £1512; and when all the outlying districts have made their returns the total is expected to reach at least £1700, which is the largest amount ever obtained.

ROYAL SANITARY INSTITUTE (90, BUCKINGHAM PALACE-ROAD, S.W.).—The next sessional meeting will be held at the Town Hall, Weston-super-Mare, on Saturday, June 30th, at 11.30 A.M., when Dr. W. G. Savage (medical officer of health for Somerset) will open a discussion on "Meat Inspection in Rural Districts." Dr. W. J. Howarth will be in the chair.

BENN ULSTER EYE, EAR, AND THROAT HOSPITAL, BELFAST.—At the annual meeting of subscribers to this hospital held on May 31st it was reported that during the past year there were 1560 new extern patients, while 470 were admitted to the wards. Five of the members of the medical staff have been granted commissions. The financial condition of the institution was sound, though it was stated that less than one-sixth of the income of the hospital was received from the public.

NATIONAL DENTAL AID FUND.—On Tuesday, June 12th, at the Mansion House, the Lord Mayor presided at a meeting of this fund, which is really an extension of the Soldiers' and Sailors' Dental Aid Fund. The movement, which is known as the Ivory Cross, will now give dental aid to discharged service men, the home army, the mercantile marine, and the necessitous poor. It has the support of the dental profession, and letters of approval were read at the meeting from, amongst others, Sir Arthur Newsholme (Medical Officer, Local Government Board), Sir StClair Thomson, M.D., Mr. W. H. Dolamore (President, British Dental Association), and Mr. W. Francis Mellersh (President, Metropolitan Branch, British Dental Association). The temporary offices of the fund are 10, Conduit-street, W. 1.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Parliamentary Session.

Both Houses of Parliament have now resumed after the Whitsun Recess.

HOUSE OF COMMONS.

THURSDAY, JUNE 7TH.

American Medical Men in France.

Sir GEORGE GREENWOOD asked the Under Secretary for War whether a large number of American doctors had recently been sent, by arrangement with the British Government, to treat British wounded soldiers in France; whether the American degrees of such doctors had been recognised for this purpose; whether he was aware that American osteopathic doctors held similar degrees and diplomas to those held by the doctors so sent to treat British wounded in France and were equally qualified to practise in the United States; and whether, in view of these facts, he would give permission to American osteopathic doctors, duly qualified in America, to attend to and treat British wounded in this country in cases where the patients might so desire.—Mr. MACPHERSON wrote in reply: A large number of doctors commissioned in the Army of the United States have been sent to Europe, and many of the most eminent practitioners in the United States are included. The American Government has commissioned the officers sent, and it is not proposed to look for any other security that these officers are qualified for the duties assigned to them.

Medical Re-examinations.

Answering Mr. JACOBSEN, Mr. MACPHERSON stated that no special or secret instructions had been issued to the Army medical authorities in connexion with re-examinations under the Military Service (Review of Exceptions) Act beyond those which had already been placed in the Library of the House of Commons.

Sterilised Meat.

Mr. FIELD asked the Secretary to the Local Government Board, in view of the fact that continental nations had for many years arranged conditions whereby partially tuberculised meat was sterilised, marked, and sold at a cheaper rate with benefit to the working consumers, whether he would make similar arrangements so that the meat food-supply might be fully availed of.—Mr. HAYES FISHER answered: I am in communication with the Ministry of Food with regard to this subject.

FRIDAY, JUNE 8TH.

Exchange of Prisoners.

Answering Mr. HUME-WILLIAMS, who asked whether an agreement had been entered into between France and Germany for the mutual repatriation of prisoners interned in Switzerland, and whether negotiations were pending for the conclusion of a similar agreement between this country and Germany, Mr. J. F. HOPE (representing the War Prisoners' Department) said: The answer to the first part of the question is in the affirmative. The agreement relates to prisoners of war who are found by a Swiss Medical Commission to be totally unfit for military service. The decision of this commission must, however, be confirmed by another commission of one military and two medical officers appointed by the captor Governments. An agreement has been concluded between H.M. Government and the German Government on similar lines. This agreement is not yet actually operative so far as we know. I should explain that the number of British prisoners of war who will benefit by the agreement is not likely to be considerable, and that a few men have already been repatriated from Switzerland on the ground that their health has deteriorated to such an extent since their transfer from Germany as to make them eligible for repatriation under the repatriation agreement already existing with Germany.

Mr. HUME-WILLIAMS: How soon will the agreement become actually operative?—Mr. J. F. HOPE: I imagine at once.

Mr. HUME-WILLIAMS asked whether any British and Turkish prisoners had yet been exchanged.—Mr. J. F. HOPE replied: No exchange of British and Turkish prisoners of war has yet taken place, nor, unfortunately, is it likely that any can take place in the immediate future. In a note which has just reached H.M. Government, after a delay of over two months, the Turkish Government pass over the proposals made to them for the exchange of 100 or 600 invalid prisoners a side as a first instalment and express the desire to revert to the arrangement reached last year, according to which all prisoners were to be exchanged who came up to a certain standard of incapacity. As it appears that the Ottoman Government only considers that 11 of the British prisoners of war who were in their hands in December last reach that standard it is clear that such an arrangement would prove wholly unsatisfactory. The Turkish Government is, therefore, now being pressed for a specific reply to the above-mentioned proposals for numerical exchange.

Sir J. JARDINE: Does the answer refer merely to British prisoners, or does it include Indians?—Mr. J. F. HOPE: Speaking from memory, I think it includes both.

Replying to a further question by Mr. HUME-WILLIAMS, Mr. J. F. HOPE stated that the United States Ambassador had left Constantinople, and the protection of British interests in Turkey was now in the hands of the Netherlands Minister. The United States Ambassador was not able, so far as was at present known, to take advantage, before leaving, of the promised permission to cause internment camps to be visited by his representatives. The Netherlands Minister had been requested to cause the camps to be visited, but it was not known whether he had been able to do so, and no reports had yet been received.

The Supply of Flavine.

General CROFT asked the Under Secretary for War (1) whether the properties of flavine were known to the medical profession in January last when a preliminary report was published in the *British Medical Journal*, and whether up to this time substantial quantities of flavine could not be obtained for the treatment of wounded soldiers in any hospital either at home or abroad; and (2) whether the War Office had received information as to the properties of the new antiseptic flavine; if so, what steps had been taken to obtain it; to whom was the order given for the supply of flavine and within what time was the order executed; whether there had been any delay in the execution of this order; and, if so, what was the reason.—Mr. MACPHERSON answered: The antiseptic properties of the substance referred to were described in a preliminary report published in the medical press in January last, giving the results of experiments with a small supply of this complex substance, specially made for these experimental purposes in a Government laboratory. Arrangements were made at the time for further trials in various military and other hospitals, and steps were taken with a view to a commercial supply being made available in the event of these trials proving sufficiently favourable. The trials had been in progress since January and the effects so far obtained are under careful comparison with those of other antiseptics. Before the substance can be placed on the market a licence must be obtained from the Board of Trade, as the substance was already the subject of a patent obtained before the war. Applications were made to the Board of Trade by various firms in the middle of last month. The hearing took place on May 24th, and I am informed that

the requisite licences are now being issued to five firms. There would therefore seem to be no doubt that the supply of the substance will be made available as rapidly as the several firms can produce it.

Medical Examinations for the Army.

Mr. ANDERSON asked the Under Secretary for War whether he was aware that statements of so serious a character regarding the treatment of men sent back for medical re-examination had been made before the Northampton tribunal that it had been agreed to hold a special joint meeting with representatives of the Medical Board; whether he knew that one solicitor stated that his clients had been treated like dogs; and whether investigations into these charges would be made by his department.—Mr. MACPHERSON replied: No specific complaints of the treatment by the Northampton Recruiting Medical Board have been received in the War Office. An officer of the department recently visited the Board and found that the men were being well treated and carefully examined. If my honourable friend will give me details of any particular case of alleged ill-treatment, I will have the matter investigated immediately.

Mr. RAMSAY MACDONALD asked the honourable gentleman whether his attention had been called to the passing for active and other forms of military service involving hard physical labour of men in Leicester suffering from valvular disease of the heart, chronic rheumatism, blindness in one eye, congenital physical weakness which had incapacitated from work for years, curvature of the spine, lameness, chronic bronchitis, and similar complaints; and whether he proposed to issue instructions to the Army doctors examining in Leicester which would prevent them passing such men into the Army.—Mr. MACPHERSON said in reply: I have noted what my honourable friend says of the Recruiting Medical Board at Leicester, but I must remind him that men suffering from definite disabilities which incapacitate them for general service are being classified in the lower categories for service of an auxiliary character. Every endeavour is made not to accept for service men whose disabilities are of such a character as to unfit them for rendering military service either of a general or an auxiliary character.

Mr. PRINGLE: Is the honourable gentleman aware that men are passed into low categories and then are immediately, on subsequent examination, passed into higher categories without any real examination of their physical condition?—Mr. MACPHERSON: I am told that is not the case.

Mr. PRINGLE: It is universal.

Mr. RAMSAY MACDONALD: Is it not a fact that men passed into the lower classes of these categories have got notice to sell up their businesses and dispose of what connexion they have got, and that the mere passing of the medical examination is so serious that it ought not to be done unless it means something from a military point of view?—Mr. MACPHERSON: I am told that no special instructions to give any such notice have been given by the War Office.

Mr. PRINGLE: Can the honourable gentleman explain why the R.A.M.C. doctors pass men without putting the stethoscope to them, especially seeing that the men have been certified to be suffering from valvular disease of the heart?—Mr. MACPHERSON: The honourable Member has made these charges previously, but he has not once submitted a specific case.

Mr. PRINGLE: I have.

Mr. MACPHERSON: I may inform the House that within the last week the Director-General has visited various centres from which complaints have come, and I can assure the House that thorough investigation of each complaint is being made.

Mr. PRINGLE: Whitehall is one of them.

Mr. RAMSAY MACDONALD: Has my honourable friend inquired into the long list of specific cases which I sent to him the other day, with names, addresses, and particulars of the men about whom I have made complaints?—Mr. MACPHERSON: Yes, I have ordered inquiries to be made into each individual case.

Answering Mr. CHANCELLOR, Mr. MACPHERSON said that it was not the policy of the War Office to enlist men for any form of service for which they were medically unfit.

MONDAY, JUNE 11TH.

Health of Troops in Mesopotamia.

Replying to Sir J. JARDINE, Mr. MACPHERSON (Under Secretary for War) wrote: The general health of the whole British Forces in Mesopotamia is satisfactory. There is an ample supply of hospitals, and no deficiency of nurses has been reported. The ratio of admission to hospital is less than double that of the troops in India in peace-time. The death-rate for all causes other than wounds in action is 4·5 per 1000 per annum, which is only fractionally higher than the peace rate in India. Owing to the arrangements made to induce local cultivators to grow crops under our control, it is reported that full and varied supplies of vegetables can now be obtained throughout the year at all the principal centres.

Medical Examinations for the Army.

Mr. NEEDHAM asked the Under Secretary for War whether men who had been discharged on account of valvular disease of the heart were entitled to claim to be totally or permanently disabled in accordance with the Military Service (Review of Exceptions) Act, 1917.—Mr. MACPHERSON replied: The answer is in the negative.

Mr. NEEDHAM asked whether the honourable Member would arrange in the case of men called up for re-examination under the Military Service (Review of Exceptions) Act the examining medical board should be supplied with the man's medical history of his service in the Army.—Mr. MACPHERSON answered: Instructions have already been issued reminding recruiting officers of the necessity of obtaining the previous documents of discharged soldiers.

Mr. PRINGLE: Will my honourable friend issue instructions that the medical history of the examined men shall be considered, because the documents are simply put aside?—Mr. MACPHERSON: I will have that inquired into.

TUESDAY, JUNE 12TH.

"Manipulative" Surgery.

Mr. PETO asked the Under Secretary for War whether he was aware that the deputation of the Parliamentary Injured Soldiers' Committee was informed by the Secretary of State for War on May 8th that he would consult the Law Officers of the Crown as to the acceptance of the offer of Mr Barker and other manipulative surgeons to give free treatment to injured soldiers; and whether he had received this information and could communicate it to the House.—Mr. MACPHERSON replied: The Law Officers have not yet given their opinion on the points submitted to them.

Mr. PETO: Will the honourable gentleman take some steps to get an early decision in this matter, seeing that a great interest is taken in it by 300 Members in this House?—Mr. MACPHERSON: I have asked that it should be expedited.

WEDNESDAY, JUNE 13TH.

Medical Arrangements in Mesopotamia.

Answering several honourable Members who asked when the report of the Mesopotamia Commission and the report made by Sir William Vincent's Commission on medical arrangements there would be published, Mr. BONAR LAW (Chancellor of the Exchequer) said: The report of the Mesopotamia Commission, which includes Sir W. Vincent's report, will be published immediately without alteration.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

HICKS, CHARLES E., M.R.C.S., L.R.C.P., has been appointed Medical Officer and Public Vaccinator to the Godmanchester District of the Huntingdon Union.

RIVERS, C., Certifying Surgeon under the Factory and Workshop Acts for the Redruth district of the county of Cornwall.

SALT, A. P., M.R.C.S., L.R.C.P. Lond., Certifying Surgeon under the Factory and Workshop Acts for the Totnes district of the county of Devon.

SIMPSON, J. W., M.D., F.R.C.P. Edin., to be one of the Medical Referees under the Workmen's Compensation Act, 1906, for the Sheriffdom of The Lothians and Peebles.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BODMIN, CORNWALL COUNTY ASYLUM.—Female Junior Assistant Medical Officer. Salary £200 per annum, with board, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Physician. Salary £150 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

DUMFRIES AND GALLOWAY ROYAL INFIRMARY.—House Surgeon.

ENFIELD, ROYAL SMALL ARMS FACTORY.—Assistant Medical Officer. Salary £438 per annum.

ESSEX COUNTY COUNCIL.—Assistant Tuberculosis Officer for holiday season. Salary £30 a month.

EVELINA HOSPITAL FOR CHILDREN, Southwark, S.E.—House Physician. Salary at rate of £160 per annum, with board, &c. Also Clinical Assistant in Out-patient Department.

FARNWORTH, NEAR BOLTON, TOWNLEYS MILITARY HOSPITAL. Female Assistant Medical Officer. Salary £383 5*s.* per annum, with rations, &c.

FOLKESTONE, ROYAL VICTORIA HOSPITAL.—Resident Medical Officer. Salary £100 per annum, with board, &c

GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—House Surgeon. Salary £250 per annum, with board, &c.

HAWKHEAD ASYLUM, Cardonald, Glasgow.—Senior Assistant Medical Officer. Salary £350, with board, &c. Also Junior or Temporary Assistant.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 40, Grove End-road, N.W.—Resident Medical Officer.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, near Manchester.—Two Female Resident Medical Officers, unmarried. Salary at rate of £100 per annum.

MIDDLESBROUGH, NORTH ORMESBY HOSPITAL.—Assistant to House Surgeon. Salary at rate of £100 per annum, with board, &c.

NEW HOSPITAL FOR WOMEN, Euston-road.—Female House Physician, Obstetric Assistant, Two House Surgeons. Salary £50 per annum, with board, &c. Also Resident Medical Officer at House of Recovery, New Barnet. Salary £60 per annum.

OLDHAM ROYAL INFIRMARY.—Third House Surgeon. Salary £225 per annum, with board, &c.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL.—House Physician. Salary £200 per annum, with board, &c.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N.—Honorary Assistant Surgeon to Ear, Nose, and Throat Department.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician for six months. Salary £100 per annum, with board, &c. Also Temporary Assistant Physician Wednesday afternoons to see Out-patients. Lunch provided and travelling expenses.

ROTHERHAM HOSPITAL.—Junior House Surgeon. Salary £150 per annum, with board, &c.

SALFORD ROYAL HOSPITAL.—Junior House Surgeon. Salary at rate of £150 per annum, with board, &c.

SALFORD UNION INFIRMARY, Hope, Pendleton, near Manchester.—Female Assistant Resident Medical Officer. Salary £250 per annum, with rations, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SHEFFIELD UNION HOSPITAL, Firvale.—Female Resident Assistant Medical Officer. Salary £250 per annum, with rations, &c.

SHREWSBURY, ROYAL SALOP INFIRMARY.—House Physician. Salary at rate of £200 per annum, with board, &c.

WEST LONDON HOSPITAL, Hammersmith-road, W.—Evening Clinic for Venereal Diseases. Clinical Assistants.

WESTMORLAND CONSUMPTION SANATORIUM AND HOME, Meathop, Grange-over-Sands.—Assistant Medical Officer. Salary £300 per annum, with board, &c.

WIGAN, ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY.—Medical Officer to take charge of Out-patient Department. Salary £250 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Bromley, Lisnaskea, and St. Agnes.

Births, Marriages, and Deaths.

BIRTHS.

BADGEROW.—On June 7th, at Hill-street, Knightsbridge, the wife of Major George W. Badgerow, F.R.C.S., Harley-street, W., of a daughter.

HILL.—On June 7th, at a nursing home, the wife of J. Percival Hill, M.A., M.D., of a daughter.

WELLS.—On June 6th, at Orleans Lodge, Winchmore-hill, N., the wife of Arthur G. Wells, M.B., B.S., D.P.H., M.R.C.S., L.R.C.P., Barrister-at-Law, of a son.

MARRIAGES.

DENNIS—CASSWELL.—On June 5th, at St. Mary's, Battersea, Captain Arthur Wesley Dennis, R.A.M.C., to Mary Theodora, eldest daughter of George Casswell, Gosberton, Lincs.

DICKSON—CUNNINGHAM.—On June 5th, at St. George's U.F. Church, Edinburgh, Captain Robert Milne Dickson, R.A.M.C., to Kate Wilson, daughter of the late William Cunningham, Dundee, and Mrs Cunningham, Merchiston Bank-gardens, Edinburgh.

FULLER—O'DONNELL.—On June 4th, at the Oratory of the Sacred Heart, Bournemouth, Captain R. Annesley Fuller, M.C., R.A.M.C., to Madeleine Mary, younger daughter of the late W. M. O'Donnell, F.R.C.S., of Glenreigh, Tipperary.

KEMP—DAVEY.—On June 6th, at Hampstead Parish Church, Charles Gordon Kemp, M.C., M.D., temp. Captain, R.A.M.C., to Kathleen Emily Davey, niece of Colonel J. and Mrs. Stollery, Hove.

WILLS—CROOK.—On June 7th, at Marlow Parish Church, Lieutenant Francis H. P. Wills, R.A.M.C., to Dorothy, eldest daughter of the late Peter Crook and of Mrs. Crook, of Borwick Lodge, Ambleside.

DEATHS.

BURN.—On June 7th, at Beechwood, Upper Tooting, S.W., William Barnett Burn, M.D. Lond., B.Sc. Lond., M.R.C.S., L.S.A., F.R.M.S., aged 73.

THORNE.—On June 11th, after a short illness, William Bezly Thorne, M.D., of Harley-street, W.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE BRITISH WOMEN'S HOSPITAL COMMITTEE.—This committee has forwarded to the Scottish Women's Hospitals a cheque for £10,000, which includes the profits of the season of *The Passing of the Third Floor Back*. The same committee has also given £500 to the Royal College of Nursing and £500 to the Hampstead and North-West London Hospital.

Notes, Short Comments, and Answers to Correspondents.

CURIOUS TOPOGRAPHICAL NAMES.

To the Editor of THE LANCET.

SIR,—We are becoming daily more familiar with many curious names of places and it is interesting to watch any which have a medical significance. The following is a little collection of names of altitudes and lakes in Canada which has some interest and arouses speculation as to their origin, and in some cases appear to reflect the influence of medical matters on the minds of people who likened places to medical fancies. In Alberta: Chin Hill, Knee hills, Medicine Lodge hills, Sulphur Mountain. In Assiniboia: Medicine Hat, Old-man-on-his-back plateau. In Athabaska: Knee Lake. In British Columbia: Bald Mountain, Eliza Ears, Face Mountain, False Ears, Family Humps, Finger Mountain, Golden Ears Mount, Heart Mountain, Nipple Summit, Nose Peak, Stone Nipples, Three Finger Peak, Thumb Peak. In Keewatin: Medicine Stone Lake, Woman Lake. In Manitoba: Bone Lake. In Ontario: Elbow Lake. In Quebec: Hair-cutting Lake, Tongue Lake. There are post-offices in Canada of the following names: Asbestos, Brown's Nurseries, Cap Santé, Elbow River, Eyebrow Hill, Finger Board, Gros Ventre (Assiniboia West), Hemlock, Henry's Corners, Heal, Mouth of St. Francis, North Gut, Science Hill, Skull Creek, Soda Lake, Sulphur, Thigh Hill, Tongue Creek.

In names familiar in connexion with the war Canada is rich, for there are Vienna, Berlin, Paris, London, and Bruxelles, Verdun and Namur, Flanders, Baltic, and Libau, Lemberg, Metz, and Krakow, Alsace and Lorraine, Lille and Amiens, Dieppe and Boulogne, four "French Villages," and three "French Rivers." There are Aldershot and Chatham, Dover and Harwich, Greenwich, Gosport, and Gibraltar, Egypte and Cairo, and Garden of Eden (near Tigris and Euphrates), while a prophetic instinct was shown ten years ago at least in the naming of Kaiser, Hun's Valley, and Gas Line, with Tanks (hill) 24 feet high in Prince Edward Island, and Marconi, not to mention "Round Up" and "New Germany." As a reminder of previous wars Canada has Mafeking, Ladysmith, Kimberley, Majuba Hill, Balaclava and Alma, Lucknow, Bannockburn, Waterloo, Trafalgar, Second Peninsula, while Nelson and Wellington and Washington are there with Collingwood, Havelock and Buller. Kitchener and French are there and a "Victoria Cross." Jeanne d'Arc, Bismark, and Moltke are there with Agricola and Germanicus. Asquith, Balfour, Earl Grey, and Carson are included. There is a psychology in names and I think the above will show some evidence of it.

I am, Sir, yours faithfully,

London, June 6th, 1917. ONOMATOLOGIST.

CAMPHORATED VASELINE OIL.

OWING to the fact that liquid vaseline is easier to sterilise than olive oil, certain French pharmacists have been tempted to utilise it in the preparation of camphorated oil. The substitution is not always devoid of consequences. Several instances were recently brought before the Paris Surgical Society of extensive and obstinate indurations which had resulted from injections of *soi disant* camphorated oil. In every instance inquiry elicited the fact that vaseline oil had been used in the preparation. Histological examination showed the indurations to consist in the main of inflammatory tissue containing numerous polynuclear cells. Physicians should not be tempted to prescribe, or dispensing chemists to substitute, liquid vaseline oil for the more assimilable vegetable oil.

PLAGUE AMONG RATS IN AN INDIAN ASYLUM.

Colonel W. H. B. Robinson, I.M.S., in his report for 1916 on the Lunatic Asylum at Nagpur (Central Provinces), gives credit to the work of a deputy superintendent, to whose administration he ascribes the fact that, though plague was raging all round and rats were dying all over the asylum, none of the inmates were attacked.

MEDICAL BARONETCIES.

To the Editor of THE LANCET.

SIR,—It may interest certain readers of THE LANCET to know that Dr. Frederick Taylor is the ninety-fourth member of the medical profession to receive the honour of the baronetcy. King James I., at the institution of the Order in 1611, offered the first patent to his physician, Dr. Henry Atkins. Dr. Atkins, however, refused the honour, probably on account of an onerous condition attached to it at that time—namely, the maintenance for three years in the province of Ulster of 30 soldiers. The premier medical

baronet was Sir Edward Greaves, so created in 1645 by Charles I., to whom Dr. Greaves was physician-in-ordinary.

The number of medical baronets created by succeeding monarchs is as follows: By Charles II., 5; by George I., 1; by George II., 2; by George III., 17; by George IV., 5; by William IV., 5; by Victoria, 38; by Edward VII., 11; by George V., 9. "Jacobite Baronetcies" were conferred by "James III." upon two of his medical adherents. Inherited baronetcies have been held by 19 medical men.

I am, Sir, yours faithfully,

S. D. CLIPPINGDALE.

Holland Park Avenue, W., June 9th, 1917.

A QUAINT RHYMING CIRCULAR.

THE following extract from the *New York Packet* of Oct. 11th, 1784, is an interesting memento of the time when rhyming circulars and catalogues were issued—an accomplishment almost impossible now, we should imagine, with the multiplicity of sesquipedalian terms:—

At the Medical Pillar, corner of Wall street and Hanover-square, head of the Coffee-house bridge, Smith, Moore & Co. have for sale, a general Collection of the Materia Medica, Botanical, Clymical and Galenical.

Produc'd from field, from fire, and pot, [and root,
Each compound, mineral herb, Radex Colomb; Glyz: Gent: Valerian;
Cortex Semarub: Winterian;
Rochelle and Glauber's salts, and shell Lac;
Gums of Greek name and Arabac,
Galb: Kino: and Opoponax,
Opium, Juniper, and Styrax,
Camphor, Thus, Aloes, Gualac,
Myrrh, Gamboge, Scammony, Ammoniac; [you'll find
Fine flowers of Su'phur: here
The red Bark too of purest kind;
Magnesia, Allum, Cream of Tart,
Tamarinds, Coral, and Sal Mart:
Syrups and Extracts, Seeds and Senna, [Manna,
Musk, Saffron superfine, and
Caraway, Fennel, Spanish Flies,
Cam'mile, Cinnabers, and Crab's-eyes, [white,
Best leathern skins, the red and
And Candied-sugar brown and light;
Figs, Sago, Salop, and Tin-foil,
Pearl-barley, Starch, and Olive Oil,
Spice, Raisins, Currants, Surgeon's tow, Wax,
Salt-petre, Bismuth, Potash, Borax,
Green oil-cloth, Sponge, Alleppo-galls, [balls,
Corks, Acqua Fort: Zinc: Liqu'rice
Balsam Canadian, and Tolu,
Capivi, Gilead, and Peru,
The purest Æther, Eau du Luce,
Liquor by Hoffman, Lemon Juice,
Isinglass, and Hartshorne shavings,
To clear your coffee or wine-leavings, [Viv.
Strong Oil of Bays, and Argent.
For Hessian vermin left alive.

THE SALICYLIC TREATMENT OF RHEUMATISM.

To the Editor of THE LANCET.

SIR,—Being surgeon in charge of H.M.S. *Salamander* off the north coast of Australia, Surveying Service, in 1862, I had a case of acute rheumatism and, being a thousand miles from a drug-store, I wanted to prescribe quinine but found we were out of it and had only, casually, a bottle of salicin, then hardly used in medicine. This I administered with good results. I think I must have been thus the discoverer of the salicylic treatment of rheumatism.

Perhaps some curious reader might enlighten me, as I think it was the first instance of that great anti-rheumatic remedy being used.—I am, Sir, yours faithfully,

Valparaiso, Chili, April 26th, 1917. RICHARD CANNON, M.D.

*** The late Dr. T. Maclagan stated (THE LANCET, 1876, i., 342) that the idea of treating acute rheumatism with salicin occurred to him in November, 1874.—ED. L.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETING OF SECTION.

Thursday, June 21st.

DERMATOLOGY (Hon. Secretaries—J. E. R. McDonagh, Henry MacCormac): at 5 P.M.
Cases (at 4.30 P.M.).

LONDON DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C. 2.
TUESDAY.—4.30 P.M., Annual Meeting. Election of Officers and Council. Clinical Cases will be shown by Capt. Underwood, R.A.M.C., Capt. W. Griffith, R.A.M.C., Dr. J. L. Bunch, Dr. W. K. Sibley, Dr. G. P. Mitchell, and Dr. M. Dockrell.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY, West London Hospital, Hammersmith-road, W.
FRIDAY.—8 P.M., Reception. 8.15 P.M., Cavendish Lecture:—Capt. A. Macphail, C.A.M.C.: A Day's Work. Annual Conversazione.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East.
TUESDAY AND THURSDAY.—5 P.M., Croonian Lectures:—Lieut.-Col. J. G. Adami, A.D.M.S.: Adaptation and Disease. (Lectures II. and III.)

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. B. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).
WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).
THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. B. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.
Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—
WEDNESDAY.—4 P.M., Lecture X.:—Dr. E. J. Russell: Food Production in Peace and War. Followed by a discussion.

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We cannot prescribe or recommend practitioners.

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ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d*. The rates of subscription remain as revised in October.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, June 13th, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
June 7	0·04	129	81	59	64	68	Cloudy
,, 8	...	99	73	57	61	68	Fine
,, 9	...	115	77	58	61	68	Fine
,, 10	...	113	76	54	55	64	Cloudy
,, 11	...	124	82	56	58	64	Fine
,, 12	...	121	83	57	61	67	Fine
,, 13	...	122	83	63	65	71	Fine

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

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ALLEN, GEORGE, AND UNWIN, LIMITED, London.
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Anæsthetics: A Practical Handbook. By J. Blomfield, M.D. Cantab. Fourth edition. 4*s.* net.
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Physical Remedies for Disabled Soldiers. By R. Fortescue Fox, M.D., and Others. 7*s.* 6*d.* net.

CAMBRIDGE UNIVERSITY PRESS.
Causes of Tuberculosis, together with Some Account of the Prevalence and Distribution of the Disease. By Louis Cobbett, M.D., F.R.C.S. 21*s.* net.

CLARENDON PRESS, THE, Oxford. (HUMPHREY MILFORD, London.)
Three Lectures on Experimental Embryology. By J. W. Jenkinson, M.A., D.Sc., sometime University Lecturer in Embryology and Fellow of Exeter College, Oxford. With a Biographical Note by R. R. Marett, M.A., D.Sc. 7*s.* 6*d.* net.

METHUEN AND CO., London.
A Psychic Vigil in Three Watches. Anonymous. New edition. 5*s.* net.

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The Transactions of Lord Louis Lewis. By Roland Pertwee. 5*s.* net.

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How to Become a Dispenser: The New Profession for Women. By Emily L. B. Forster. 2*s.* 6*d.* net.

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Fresh Hope and Health for Wounded and Disabled Soldiers. By Cecilie Muller. 1*s.* net.

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A Lecture

ON THE

TREATMENT OF WAR WOUNDS.*

SUPPLEMENTED BY ADDITIONAL MATTER RELATING TO ANTISEPTICS AND THE METHOD OF CARREL.

BY COLONEL SIR ALMROTH E. WRIGHT, M.D., C.B., F.R.S.,

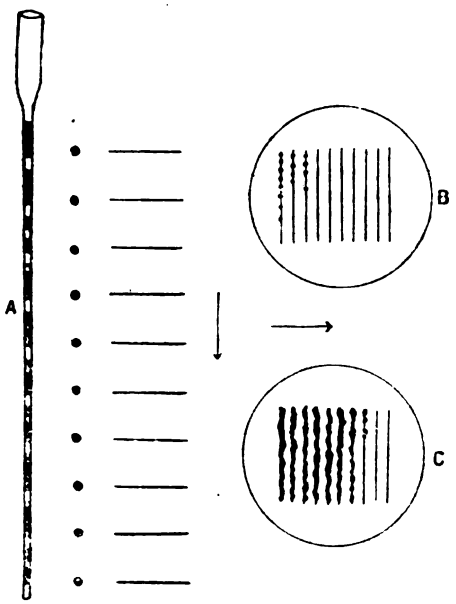
A CONSULTANT PHYSICIAN TO THE BRITISH ARMY IN FRANCE.

WE are wont to classify the patients in our military hospitals into sick and wounded. In reality all, or nearly all, are suffering from bacterial infections. And the essential difference between the sick and the wounded lies in this, that the sick are suffering from infections spontaneously contracted, the wounded from infections induced by mechanical injuries. My theme is the treatment of this latter class of infections. They are distinguished by certain quite special features.

In spontaneous infection we have to deal with microbes which have fought their way into the body, and generally only a single species of microbe will have done this. In wounds we have microbes mechanically driven in, and every sort of microbe which exists in external nature may thus be introduced.

Furthermore, the disposition of the microbes in war wounds is fundamentally different from that in ordinary surgical wounds. In war wounds the infection is disposed in part upon lacerated raw surfaces; and in part it is carried deep into the substance of the tissues. Moreover, the infected lacerated surfaces are left denuded of skin and exposed to injurious external influences; and the infection which is carried down into the tissues is left as a buried infection. Now there is in ordinary surgical operations nothing at all comparable to this. The surgeon never leaves cut surfaces naked and exposed, or a buried focus of infection unopened.

FIG. 1.



Method of pyo-sero-culture.—A, Pipette which has been implanted by the wet-wall method, and has then been filled in by the wash and after-wash procedure with unit volumes of serum. By the side of the pipette to the right are ranged a series of drops representing the series of unit volumes of serum blown out in order from the pipette, and, finally, to the right of the drops are a series of lines representing linear implantations made upon agar. B, Results of the series of linear implantations made with the unit volumes of the patient's serum. C, Results of the series of linear implantations made with the unit volumes of the normal serum which was used as a control.

* In its original form this lecture was delivered at the Royal Institution on March 9th, 1917.

This will have brought it home to you how especially difficult are the conditions which have to be dealt with in the infected war wound. But let me before embarking upon the question of their treatment, first tell you something about the natural agencies by which the inroads of microbes are combated. You are, of course, aware that we are guarded against microbic infection by our blood fluids and our white blood corpuscles.

THE BODY FLUIDS.

Let me begin with the blood fluids, and let me take you directly to the following experiment. I call it the experiment of *pyo-sero-culture*—i.e., the experiment in which we implant pus into serum to see which of the microbes of the wound can grow in the blood fluids.

We procure for our experiment a suppurating wound. We take from it a specimen of pus containing a large variety of different organisms. At the same time we take from the patient's finger a sample of blood; and we take a specimen also of our own. When the serum has issued from the clot we take a capillary pipette, fit a rubber teat to the barrel, and inscribe a mark upon the stem at about say one-third of an inch from the tip. We now aspirate a little pus into the stem, drawing it up only as far as our fiducial mark, and blowing it out again leave a wash of pus upon the walls. This done, we sterilise the tip of the pipette, and then aspirate into the stem a series of unit-volumes of serum, dividing each volume off from the next by a bubble of air. The pipette when filled in this manner presents the appearance shown in Fig. 1; and we have now in the proximal end our first and heaviest implantation of pus, and in the distal end our last and lightest implantation. The pipette is after this placed in the incubator to allow every microbe which is capable of growing in serum to do so. After an interval of six or more hours we proceed to our examination. What we do is to blow out our series of unit-volumes of serum in separate drops and examine under the microscope; or, better, we plant out a sample of each drop upon a separate seed-bed. Here in B and C you have the results of such culture represented diagrammatically—the meagre crop in B being that obtained with the patient's serum and the more copious crop in C being that obtained with normal serum.

FIG. 2.



A portion of a pyo-sero-culture planted out upon an agar slant divided up by furrows into a series of seed beds.

And you have in the next figure (Fig. 2) a drawing of an agar tube implanted from a pyo-sero-culture made with the serum of a wounded man. In the upper part of the agar tube you see two seed-plots implanted from the distal portion of the capillary stem. These have remained sterile. In the middle of the tube you see three plots implanted from the unit-volumes of serum which occupied the middle region of the capillary stem. These have grown colonies of only one species of microbe—the streptococcus. At the bottom of the tube you see seed-plots implanted from the proximal end of the capillary stem. These are over-grown with colonies of staphylococcus. But no doubt interspersed with and overgrown by these are also colonies of streptococci. If instead of cultures from the patient's serum, I had been showing you here cultures from normal serum, what you would have seen would have been a much larger number of fertile seed-plots, and the seed-plots implanted from the proximal end of the pipette would have shown a large assortment of different colonies.

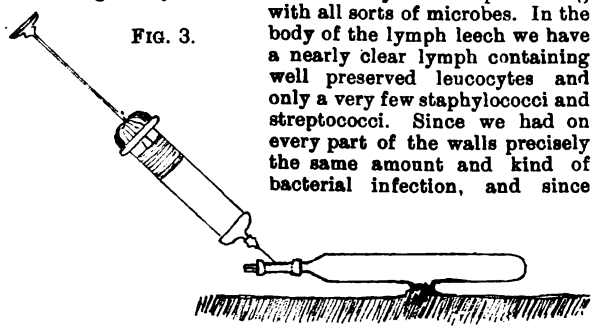
We learn from such experiments three lessons: *first*, that in the uncorrupted serum in the distal region of the pipette only two species of microbes from the wound can grow and multiply; *secondly*, that in the corrupted serum in the proximal end of the pipette all the microbes of the wound can grow; and, *thirdly*, we learn from a comparison of the

wounded man's serum with the normal serum that the former offers more resistance to microbic growth, and is less easily corrupted by the addition of pus.

Cause of the Corruption of the Serum.

Experiments of this kind clearly do not tell us the cause of the corruption of the serum. It may be due to some chemical addition to the serum or to something special in the character of the bacterial implantations. This point we can clear up as follows. We go back to our very septic wound. We clean it out carefully by syringing. That leaves us with a wound cavity clean but still abundantly infected. We then take the little cupping apparatus which is shown in Fig. 3. We apply it to the walls of the wound, using light pressure. Then, puncturing the attached rubber tube with the needle of a hypodermic syringe, we withdraw the contained air, and leave our lymph leech *in situ* adhering by negative pressure till the time for redressing the wound comes round. When we now go back to our wound we find there two quite different discharges. We have in the general cavity of the wound a thick pus containing many broken-down leucocytes and pullulating with all sorts of microbes. In the body of the lymph leech we have a nearly clear lymph containing well preserved leucocytes and only a very few staphylococci and streptococci. Since we had on every part of the walls precisely the same amount and kind of bacterial infection, and since

FIG. 3.



Lymph leech in position, showing technique for exhausting the air.

we are in each case dealing with the self-same lymph and leucocytes, this difference of results would seem to be due to our having in the lymph leech, owing to the negative pressure employed, a larger proportion of blood fluids.

But with this the problem is, as you see, only incompletely resolved. We have learned that the corruption of the discharges is not determined by the nature of the bacterial implantation; we have reason to think it is hindered by a larger afflux of lymph; and it looks as if it might have something to do with the breaking down of the leucocytes, but we have not yet put our finger upon the particular element that takes away from the serum its power of inhibiting microbic growth, converting it into a congenial pabulum for all manner of micro-organisms.

Let me in this connexion invite you to consider, for that may perhaps put us on the path for the solution of our problem, a scheme of classification of the albuminous substances. I would propose to classify them from the point of view of their capacity to furnish pabulum for microbes, and to distinguish three classes of albuminous substances. First, would come *digested albumens*. It is a familiar matter that these furnish very congenial pabulum for microbes. In the form of peptone we use them for all our artificial cultures. A second category of albumens would be *native albumens*. Muscle, milk, and eggs furnish such albumens. These are not like digested albumens, directly assimilable. Before they can be assimilated, either by ourselves or by microbes, they must be broken down into simpler elements by digestion. We ourselves, and a certain number of microbes also, are furnished with digestive ferments which convert native albumens into pabulum. There is yet a third class of albumens. I would venture to call these *defended* or *protected albumens*. These cannot, like the digested albumens, be directly assimilated. Nor can they, like the native albumens, be directly digested. They are specially defended against the attack of digestive ferments. The albumens of the serum may be ranged in this class of "defended albumens." It is well known with respect to serum that it has a power of neutralising digestive ferments,[1] and we express that fact by saying that the serum has an antizymotic, and in particular an antitryptic, power. You will, perhaps, not immediately perceive that the fact that the serum is antitryptic in any way elucidates our problem. But let us take that fact and put it in another way and then consider. Let us, instead of saying that the serum has an antitryptic property, say that it has a power of preventing its constituent albumens being converted into pabulum for microbes, and immediately, as I think, light is projected upon our problem. For once we envisage the facts in that way we are immediately impelled to inquire whether the serum's power of inhibiting bacterial growth may not be due to its power of neutralising digestive ferments, and whether the corruption of the lymph in the cavity of the wound may not be due to a collapse of its defence against proteolytic attack.

That is a point which is very easily settled by direct experiment. And let me now show you what happens when we add trypsin to a serum which has been implanted with microbes. I have here two tubes of a serum implanted two days ago with a minute quantity of pus containing a variety of different microbes. To the one I added trypsin, the quantity added being less than that required to neutralise its antitryptic power. The other tube of the implanted serum served as a control. Both tubes were then placed in the incubator. And you see the difference. The trypsinised serum is turbid with microbic growth. That is, we have here exactly the same result as that obtained in the sero-pyo-culture experiment in those volumes of serum which were heavily implanted with pus; and the same result also as was in the lymph leech experiment obtained in the pus of the wound cavity. Our control serum has, as you see, remained almost perfectly clear. That is the same result as was obtained in the sero-pyo-culture experiment with our lightly implanted serum, and again in our lymph leech experiment in the cavity of the lymph leech.

All this, as you see, points to the corruption of the blood fluids being due to a loss of antitryptic power. This view wins further support from the following facts: 1. There is in every suppurating wound, as we shall presently see, a source from which trypsin can be derived. 2. Blood fluids which inhibit microbic growth are strongly antitryptic; and blood fluids which we find teeming with microbes are tryptic. 3. We have in the blood of every wounded man a markedly increased antitryptic power (you saw in our pyo-sero-culture experiment what results from this); and in the blood of heavily wounded men on an average a three- or four-fold increased antitryptic power. That clearly teaches that the body when endangered takes steps to protect itself non-specifically against all microbic infections of the blood fluids.

THE LEUCOCYTES.

I now pass on to consider the leucocytes and the part they play in the destruction of microbes. You already know with respect to leucocytes that they can emerge from the blood-vessels, burrowing their way out through small pores in the capillary walls; that they make their way to every focus of infection; that they ingest microbes when these have first been prepared by the action of the blood fluids; and, finally, you know that the leucocytes can, if things go favourably, digest and dissolve the ingested microbes. There would by consequence in connexion with the leucocyte be three functions to study. First would come emigration, then phagocytosis, and then intracellular digestion. Emigration has up to the present been studied only in the interior of the organism. You will realise that means that it has been studied only in difficult setting and in the presence of all sorts of disturbing factors, and you will appreciate that we want now a new and better technique. For we require for the treatment of the infected wound to find out how best to call out the leucocytes; and how, when occasion requires, to restrain their emigration.

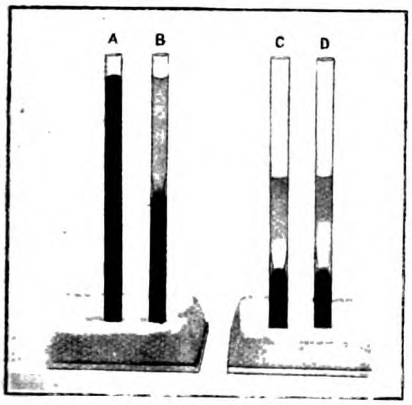
I have in connexion with this a technique to describe to you, but first I want you to appreciate what we can and what we cannot expect from leucocytes in the matter of locomotion. Leucocytes can, we know, make their way out through small openings. They can also travel over any ordinary surface. They can edge their way along faster when lightly compressed between two surfaces. They can crawl along strands, creep through a meshwork, and climb a scaffolding. But they are unable to climb a vertical glass wall. And again, they are unable to swim, and so once they

[1] Let me here incidentally call attention to the fact that the application of horse serum will prevent and very effectually relieve the digestive erosion of the skin which is in enterostomy of the upper part of the small intestine produced by the outflow of pancreatic juice.

get into open fluid they simply go to the bottom. If we are anxious to find something to which we may compare them we may liken them to very minute slugs crawling along surfaces and climbing trellises, but brought up short by any considerable barrier of fluid.

All these points must be considered if we want to arrive at a technique for the experimental study of emigration, using for the study of emigration specimens of blood withdrawn from the body. The containing blood vessel can in certain respects be imitated by a glass tube, and we can, to facilitate observation, use tubes drawn out flat, such as shown in Fig. 4. But our artificial capillary differs from the natural one in having impermeable instead of permeable walls. This, of course, makes emigration through the walls impossible. None the less, we can in these tubes study emigration. We can institute races for leucocytes along the length.

FIG. 4.



Drawing of four flattened capillary tubes—A, filled in with blood; B, a similar tube after centrifugalisation showing above the "white" and below the "red clot"; C and D, similar tubes after incubation. Leucocytic emigration visible to the naked eye as opaque white bands occupying the lower portion of the white clots. In D, where physiological salt solution had been imposed upon the white clot, the band of emigration is much broader than in C.

But first certain preparations must be made. The course must be cleared of all obstructions—i.e., the red corpuscles must be got out of the way. Next the leucocytes must all be brought back behind the scratch line, and we must provide a scaffolding for the leucocytes to climb. This can all be arranged. We fill in our flat emigration tubes with blood and seal them at one end. We then, by centrifuging, bring the blood fluids to the top and the corpuscles to the bottom. The lighter leucocytes will now have arranged themselves in a layer immediately above the red, and presently the supernatant fluid will clot and the meshwork of fibrin will then provide the scaffolding we require. We can now impose upon the clot—let me for convenience call it the white clot—any chemical agent we please and let it slowly diffuse down towards the leucocytes; or if we want to study the effect of bacterial infection, we can introduce microbes into the blood before we fill it into the tube, or as an alternative fill our blood into tubes whose walls have been implanted with microbes. Finally, we set our experiment going by placing our emigration tubes in the incubator—that is, we supply to our leucocytes the necessary warmth. And we can at any moment take stock of what is occurring in our tubes by examining with the naked-eye or with the low power of the microscope through the walls. Also by a very simple technique we can extract the clot from the tube and mount and colour it, so as to bring everything clearly into view under the high powers of the microscope.

Emigration of Leucocytes: Facts with Practical Application.

I must limit myself to showing you in connexion with emigration a few outstanding facts which have a practical application to the treatment of wounds. Let me begin with the naked-eye appearances. We have in Fig. 4, C and D, emigration tubes containing centrifuged blood which have been in the incubator for about eight hours. In C—the control tube—we have centrifuged blood to which no addition has been made. In D some weak salt solution has been imposed upon the white clot. The emigrating leucocytes are visible to the eye in the form of a slightly opaque white band extending upwards from the red into the white clot. You see that in D the corpuscles have climbed higher than in C.

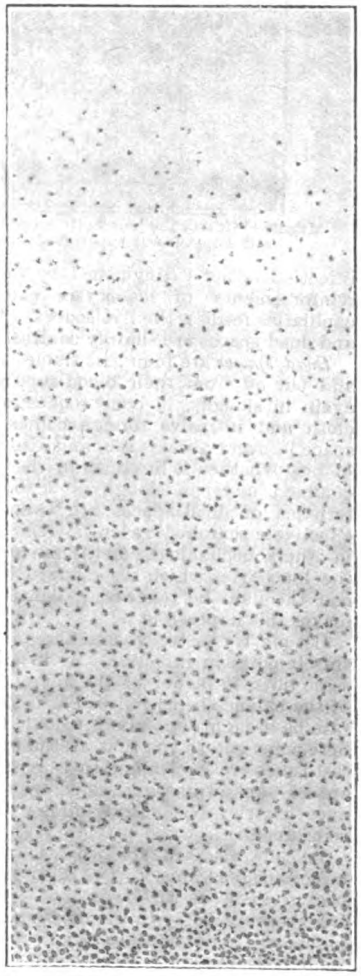
Fig. 5 shows what such a band of emigrating leucocytes looks like under the microscope. Instead of the leucocytes being all, as you will see in the next, congregated together behind the starting line, they here are actively emigrating, the more active out-distancing the others in the race.

Fig. 6 shows what happens when 5 per cent. salt solution is imposed upon the blood. That salt passes down by diffusion and arrests emigration, and I want you to notice in the one corner of the figure (and more clearly in the inset) that the few white corpuscles which were beginning to emigrate when the salt solution overtook them are broken up and destroyed. We shall presently appreciate the significance of that fact.

I next show you what happens when microbes have been implanted into the blood. Those microbes—supposing always that they are the sort that can proliferate in blood—grow out into colonies. In Fig. 7 is shown what happens when an excessive implantation has been made, and the bacterial colonies come up very thickly in the blood. You see here that emigration is entirely arrested. If that were to happen in infected tissues it would mean that the organism was there giving up the combat against the microbes.

In Fig. 8 we have again streptococcus implanted into the blood, but this time it is a much more sparing implantation. And here, as you see, the leucocytes are carrying out a raid against the microbes, each leucocyte ingesting and filling itself full with microbes.

FIG. 5.



Magnified view of the band of leucocytic emigration seen in Fig. 4, D.

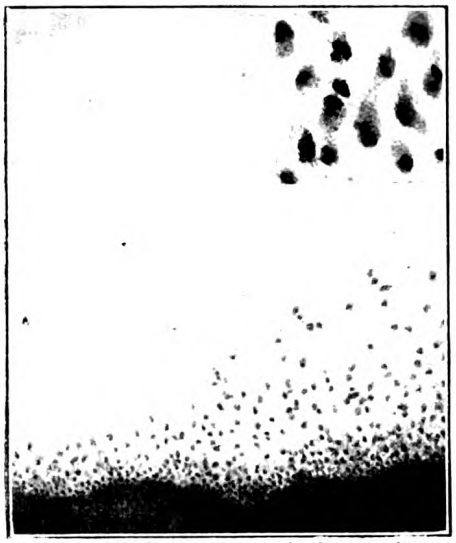
In Fig. 9 I show you what happens when we make into the blood a very heavy implantation of the gangrene bacillus. Here in the neighbourhood of the leucocytic layer things are for the moment going well for the leucocytes, for they are actively phagocyting. But farther away from that layer there are very numerous colonies of the gangrene bacillus, which are growing unimpeded. The omens are consequently unfavourable. You can see in your mind's eye what is going to happen. In the first place, all further emigration of leucocytes is going to be arrested. And, in the second place, the leucocytes which have already emigrated and ingested microbes will, instead of successfully digesting them, be gradually poisoned by bacterial toxins. And when the leucocytes are killed, their digestive ferment—you will remember my telling you that it would shortly appear that trypsin was at hand in every wound—passes out into the serum. By that, the serum will, as we have seen, be converted into a medium in which microbes can grow and pullulate.

DISTINCTION BETWEEN "LIVE" AND "DEAD" SPACES.

But we must now come back from these general questions to that of the treatment of the wound. Let me begin by explaining to you—for important questions of treatment hinge upon this—the distinction between "*live spaces*" and "*dead spaces.*"

In the lacunæ of vascularised tissues we have *live spaces*. In these we have optimum conditions for resistance to bacterial infection. We have here an antibacterial lymph; and this is continuously secreted and moved along so that all corruptive changes would be continuously antagonised and remedied. Again, we have in live spaces ground that can be effectively searched by leucocytes, and if the bacterial

FIG. 6.



Magnified view of the leucocytic layer in the case where strong salt solution was superposed upon the white clot.

infection is not extinguished by the first leucocytic attack reinforcements of leucocytes can be supplied by the capillaries feeding the live spaces. In all these respects live and dead spaces are sharply contrasted.

Dead spaces are found in tissues which have been bruised and cut off from their blood-supply. We encounter them again in sloughs, in bone sequestra, and in the texture of cloth and intrusive foreign bodies. And we have a dead space in every abscess sac, and also in every other collection of pus, whether it lies open in the pocket of a wound or is confined under a slough or scab. The essential characteristics of dead spaces are two. First, they cannot be effectively searched by leucocytes. In some cases chemical, in others mechanical, conditions stand in the way. Secondly, the leucocytes which are engaged cannot be reinforced, nor can the fluid be renewed. Isolation from the circulation makes this impossible.

Let me try to tell you in the fewest possible words what this imports in infection. If in an infected live space the scale turns in favour of the microbes, there is still a chance of the balance being redressed. Reinforcements can at any rate be brought up. In infected dead spaces—and let me here point out to you that all the experiments we conduct in test-tubes are equivalent to experiments conducted in dead spaces—an advantage gained by the microbes becomes at once irretrievable. That follows from the impossibility of reinforcement.

Let me also tell you what happens to the patient when infection goes ahead in a dead space. In the first place bacterial poisons will be absorbed, and the patient will suffer from septic fever. In the next place the microbic infection—this will generally be a streptococcic infection, but in war wounds it may be a gangrene-bacillus infection—will very often invade the surrounding tissues and from thence the blood-stream. And in the third place, the pus in the dead space will, when it becomes tryptic, eat its way into the enclosing tissues. The abscess sac will then extend in all dimensions, or else the pus will burrow in the direction of least resistance until it opens upon an inner or an outer surface.

TREATMENT OF WOUND INFECTIONS.

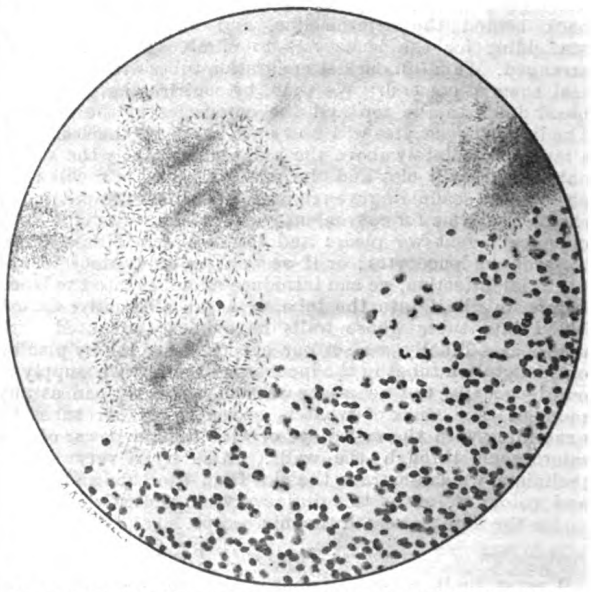
If you have now quite clearly apprehended the significant distinction between a live space and a dead space, you will with that have mastered the first great principle governing the treatment of all local bacterial infections. If you are dealing with infection in live spaces you can often mend matters by bringing (that is the rationale of hot fomentations) more blood—that means more lymph and more leucocytes to the focus of infection; and again you can often mend matters by improving the quality of the lymph—that is the rationale of vaccine therapy; or, again, you may apply both these procedures concurrently. But when you are dealing with an infected dead space you cannot in these ways mend matters. You might just as well try to influence a test-tubeful of infected fluid. Where you have infected dead spaces, your only remedy is the knife. You have to evacuate your dead space as I empty this test-tube.

Now that is the whole purpose and meaning of the surgery of the wound as carried out at the front. We can compress that into two propositions. Every infected dead space must be cut down upon and evacuated. And, as a prophylactic measure, every space which would, if left to itself, become an infected dead space—that means every space occupied by an infected projectile or pieces of infected clothing or infected foreign bodies or devitalised infected tissues—must be similarly laid open and cleaned out. That exhausts the treatment of buried infections.

But it is only the beginning of the treatment of the wound. There is still the surface infection. The situation you have to face is just the same as that produced by emptying an infected tube: you have got rid of the infected contents, you have left the infection on the walls.

I now turn to the problem as to how best to deal with this infection. And here again inevitably we must establish distinctions. We must distinguish between the *naked tissue surface* made by the act of the projectile, or section with a knife, and the *granulating defensive surface*, which after a time clothes the naked tissues. In the former we have a non-vascularised surface, and in this a system of lymph spaces left without mechanical or biological protection other than that furnished by the emigration of leucocytes and (till that stanches) by the outflow of lymph. And the naked tissue surface is not only ill defended against microbic attack, it is also peculiarly liable to damage and to physiological deterioration of the kind which opens

FIG. 7.



Leucocytic emigration restrained by excess of streptococcic infection.

the door wider to such attack. Such a surface readily dries up; and drying means the closing down of the capillary circulation. Again, seeing that it is non-vascularised, a naked tissue surface will readily take cold, and by that both lymph outflow and emigration are arrested. And lastly, a naked tissue surface, if kept wet, will as soon as the discharges become tryptic, readily undergo erosive digestion. Against all these forms of physiological degeneration we should in our treatment of naked surface infections make special provision.

A granulating surface offers much greater protection against microbic infection, and is much less subject to damage. The tissues are covered in by many layers of protective cells, the lymph spaces are sealed over, and there has

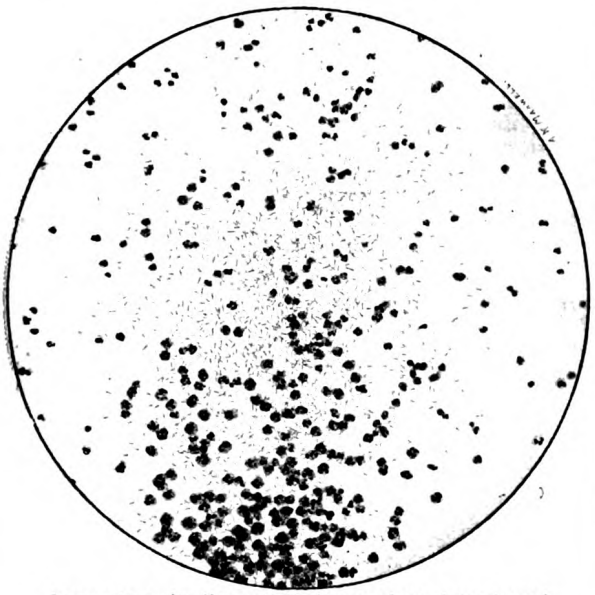
been laid down immediately below the surface in newly formed vessels a very abundant blood supply. All this gives sensible security against massive microbic invasion from the surface; against the wound taking cold; and against erosive digestion. In short, the treatment of the infected granulating surface will be less precarious than that of the infected naked tissue surface.

The Natural History of the Wound with a Naked Tissue Surface Left to Itself.

Let me first consider the natural history of the untreated wound with an infected naked tissue surface. I will take the case of an open shell wound left without treatment. According as it is wet or dry the evolution of this wound will be entirely different. Let us take first the case of its being allowed to dry. Under the original dry dressing the blood and lymph flow from the surface will gradually stanch, and we shall then have a naked tissue surface covered with a coagulated coating of blood and lymph. In this will be incorporated when the tissues have been bruised lacerated elements of moribund tissue, and there will be also included other elements of foreign matter and always a certain number of microbes. Little by little the coating of coagulated blood and lymph upon the surface of the original wound, or, as the case may be, of the surgeon's incisions, will dry up, and the capillary circulation underneath will gradually be closed down by desiccation. And all the while the serophytic microbes will be proliferating. As a result of all this the superficial tissues will die, and become gangrenous, and the originally clean naked tissue-surface will gradually be transformed into a dry, greenish-black, excessively fœtid, slough-covered surface pullulating with microbic growth.[2] Under the sloughs will then be formed infected dead spaces, and from these the infection—I am here thinking in particular of a gangrene infection—will invade the neighbouring live spaces, converting these in their turn into dead spaces until we have large areas of gangrene and a general intoxication.

That, of course, will happen only with very heavy infection or extreme physiological deterioration. With lighter

FIG. 8.



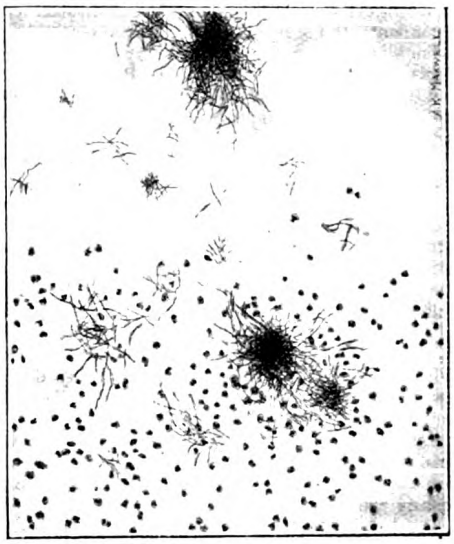
Leucocytes emigrating and attacking a colony of streptococci.

infection or less adverse physiological conditions in the wound, the invaded organism will have recourse to measures of defence. Gradually the superficial sloughs and gangrenous portions of the deeper tissues will be demarcated and then amputated from the living tissues—the amputating agent being, no doubt, the tryptic ferment in the dead spaces. And at the same time there will have been organised in the living tissues some little way back a defensive front built up upon the same plan as a granulating surface.

[2] Let us note in connexion with this microbic growth and fœtor that the albuminous substances of our tissues which, so long as they are bathed in lymph, rank as protected albumens, are, when the lymph stream dries up, degraded to the rank of unprotected native albumens.

Let me now tell you also what would happen if the infected surface is simply kept wet. Here, also, the microbes which have been incorporated in the clot would grow out. Then there would supervene leucocytic emigration, and upon that would follow a breaking-down of the leucocytes with a setting free of trypsin; and after that any and every microbe would pullulate in the cavity of the

FIG. 9.



Leucocytes emigrating and attacking colonies of the gas gangrene bacillus.

wound and in the devitalised tissues adhering to the surface. Finally, if treatment were still deferred there would be reproduced in an aggravated form (for there would in the open wound be a varied and more formidable infection) the evil train of events which is associated with infection in a buried dead space. When you reflect that an open wound cavity filled out with tryptic pus is physiologically equivalent to an unopened abscess sac, you will see that the same erosive action would be exerted upon its walls; that erosive digestion would enlarge and deepen its cavity; that these degenerative changes would enable the microbic infection to burrow everywhere deeper into the walls; and that bacterial poisons will be absorbed.

All I have been saying in the last few minutes can be compressed into this: an infected naked tissue surface becomes, if allowed to dry, *a desiccated slough-covered wound;* if simply kept wet, *a tryptic suppurating wound.* And the bacteriological events also can be put quite simply. A comparatively light infection, such as we have in the man whose wounds have been properly opened up and mechanically cleaned, is converted by transport into a very heavy infection; and a purely surface infection into an infection invading the deeper tissues.

PROBLEM OF PREVENTING THE DEGENERATION OF THE WOUND WHEN TREATMENT IS INTERRUPTED DURING TRANSPORT.

Having realised what happens to the wound when untreated, we have to think out how to keep wounds—whether originally completely open or opened by a surgeon—from falling during protracted journeys from hospital to hospital into these desperately unwholesome conditions. We have also to consider how to restore, as rapidly as possible, to their original wholesome state wounds which had lapsed into distressing conditions either through lying out untreated on the field or through interruption of treatment during lengthy transport.

Suggestion that the wound could be sterilised at the outset, and could be kept sterile by leaving an antiseptic in the wound.—The first thought of every man would probably be that the wound should be most carefully disinfected at the outset. But what happens in burns shows that to start in the case of an open wound with a sterile surface avails nothing. A burn is a form of wound which is at the outset absolutely sterile, and quite notoriously

it tends to become very rapidly intractably septic. No doubt the germs begin to arrive before the burnt surface has well cooled off, and the wound is very rapidly peopled by microbes. Without doubt this is due to the emigrating leucocytes being held back in the superficial sloughs, disintegrating there and corrupting the exuding lymph. And this is not preventable by any application of antiseptics. The same holds true of war wounds. These become heavily infected even when the wounds are drenched at the outset with the strongest antiseptics, such as undiluted carbolic acid and concentrated solutions of iodine.

This is not the place for any lengthy discussion of the reasons for this failure of antiseptics. But the gist of the matter can be put quite shortly. The real truth is that the current belief in the therapeutic efficacy of antiseptics rests on experiments which are quite fallacious. They are fallacious in that the antiseptic in those experiments was applied in watery media—media which left that antiseptic unaffected. To have value—that is, to have application to conditions obtaining *in vivo*—the experiments should have been conducted in pus or serum—media which quench antiseptic action. Again, in the experiments of the past the antiseptics were intimately mixed with the bacteria suspensions; whereas, applied in the wound the antiseptic comes only into external contact with the infected wall, and when left behind in the empty cavity only into external contact with the inflowing discharges. Employed thus we cannot expect it to diffuse into and exert a bactericidal effect in either infected tissue or pus or serum.

By reason of the fact that these considerations were in the older experiments disregarded, the issue as to whether antiseptics applied in the wound with prophylactic intent can be of any use must be investigated quite anew.

Experimental Investigation of the Efficacy of Antiseptics.

Let me now try to indicate to you what sort of experiments should be undertaken by anyone before nourishing in connexion with a particular antiseptic the expectation that it is going to be efficacious for sterilising and afterwards suppressing microbic growth in wounds. I can illustrate my points best if you let me show you here four tubes.

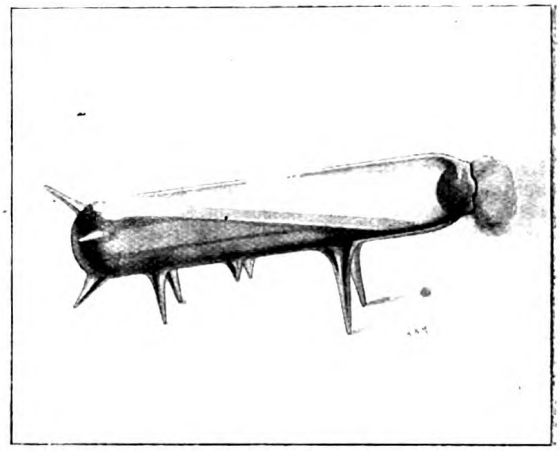
In *Tube No. 1* I have a suspension of microbes in water. I now add an equal volume of the antiseptic I wish to test and shake up thoroughly. These are, as you see, conditions which give every possible advantage to the antiseptic. It is applied in a non-albuminous medium and is intimately mixed with the microbes. To find out whether the microbes have been killed I draw off a sample and dilute with very many times its volume of nutrient medium. I then incubate to see whether I get any bacterial growth.

In *Tube 2* I make the conditions more favourable to the survival of the microbes—infinitely more favourable than if I left behind an antiseptic in a wound. I have here a mixture of staphylococci, streptococci, and gas-gangrene bacilli suspended in serum, and I now, as in Tube 1, add an equal bulk of the antiseptic and shake up, and I then, following the technique of Professor Beattie, pour on a little hot vaseline which will afterwards congeal. This, by forming an air-tight seal, will allow the gangrene bacillus, if it survives, to grow out. It will also by its congealment confine the gas which this microbe evolves, and so will announce its growth.

Tube 3 is, as you see (Fig. 10), a tube which has been drawn out into a number of hollow spikes to imitate the diverticula of the wound. My colleague, Dr. Alexander Fleming, who devised it, calls it the "artificial war wound." To imitate the conditions obtaining in the actual war wound we fill both the tube and its diverticula with an infected trypsinised serum. We now empty the tube, leaving behind of necessity in the diverticula a certain amount of the original infected fluid. We then fill with an antiseptic; and the future of the infection will now depend on the penetrating power of the antiseptic. If the antiseptic penetrates into the infected fluid sterilisation will be obtained; if it fails to penetrate the artificial wound will remain infected. To find out what has happened we empty out the antiseptic, fill in with trypsinised serum, and incubate.

After asking in Tube 3 whether the antiseptic can completely sterilise a wound which has its recesses filled with an infected albuminous fluid, I go on in Tube 4 to investigate the question as to how far the antiseptic can penetrate into the walls of the wound. *Tube 4* is, as you see, a tube with hollow spikes. I have coated it inside with infected serum agar, and the hollow spikes give a greater depth of infected lining and also a better hold for that lining. As soon as the agar has solidified the infected tube is filled with antiseptic. And then we can, after an interval, pour out the antiseptic, fill in with nutrient broth or trypsinised serum, and then incubate. Any microbes which have been left alive in the lining will now grow out into colonies, and be visible through the walls of the tube.

FIG. 10.



A test-tube standing on spike legs, representing a war wound with diverticula.

Let me show you a set of typical results obtained by the procedures I have just described, using the antiseptic of Dakin, which is to-day perhaps the most popular of all antiseptics.

In Tube 1 we have obtained, as you can see by these subcultures, complete sterilisation. And it was obtained after only momentary contact with the antiseptic. In Tube 2, where a lightly infected serum was shaken up with an equal bulk of the antiseptic and then incubated with it, we have in this mixture of serum and antiseptic a very vigorous growth of microbes. You see the medium has become turbid, and there has been an evolution of gas which has pushed up the plug of congealed vaseline. In Tube 3—and here the antiseptic stood for four hours in the barrel of the tube—we have in that barrel a teeming multitude of microbes. And in Tube 4, after four hours' contact with the antiseptic, only that very thin layer of the infected lining which coats the barrel has been completely sterilised, and in the concavity of every spike one can see that the bacterial colonies have in the depth come up quite thickly, and that it is only in the very surface layer that the microbes have been killed. And I here show you in a parallel tube which has been incubated 24 hours longer that the microbes you have seen growing in the deeper layers very soon penetrate the sterilised superficial layer, and invade the fluid contained in the barrel of the tube.

When we find an antiseptic giving results quite different from those I have here shown you it will then, for the first time, become a rational policy to use an antiseptic at the front and to leave it in the wound with a view to safeguarding the patient during lengthy transport.

Suggestion that the bacterial infection in the wound can be kept down during transport by frequent re-applications of an antiseptic.—In the earlier period of the war the only method of re-applying an antiseptic was that of taking down the dressing, syringing the wound, and completely re-dressing. That was, especially in the case of deep wounds and compound fractures, a very lengthy and painful procedure, and one which was nearly impracticable in transport. For that complete re-dressing there has now been substituted by Carrel a procedure for washing and refreshing the surface of the wound through rubber tubes. According to Carrel, Dakin's antiseptic should be employed and this should be applied every two hours. Let me about the application of this in transport say this: that it would, I think, be impracticable to carry it out on a sufficiently

large scale and sufficiently systematically; and treatment with Dakin's antiseptic applied in an unsystematic manner gives exactly the same results as simply keeping the wound wet.

Suggestion that the set-back in the wound during transport could be prevented by dressing with hypertonic salt solution.—The set-back in the wound with its resulting tragedies could, I think, be avoided by drawing out lymph in a continuous manner from the tissues, and by holding up at the same time the emigration of leucocytes. By the outflow of lymph we should be driving back and expelling invading microbes. We should also thereby be preventing the conditions in the walls of the wound becoming unwholesome to leucocytes. We should further, by the continuous outpouring of lymph, be effectively combating the corruption of the discharges in the cavity of the wound. And lastly we should, at the same time, be preventing any drying up of the wound. By holding up the emigration of leucocytes we should (you will remember that leucocytes will when they break down, furnish trypsin) be taking steps to prevent the corruption of the wound discharges.

We have in a hypertonic solution the therapeutic agent we require for these purposes. The proper way of using it is to apply to the wound three or four layers of lint thoroughly soaked in 5 per cent. salt solution; to impose upon these, as a reinforcement, three or four more layers of lint thoroughly soaked in a saturated salt solution and then cover the whole with jaconet, or other impermeable material.

REMEDIAL TREATMENT.

I now pass from discussion of the method of preventing the set-back that occurs in transport to the discussion of remedial treatment. The set-back will, as we have seen, have given us either a tryptic suppurating wound or a dry slough-covered wound. In each case the *first item in treatment* will be to get a clean surface. For that it will, in the case of the tryptic suppurating wound, suffice to wash away the tryptic pus. In the case of the desiccated slough-covered wound we must get rid of the sloughs. The rational way to do that will be by *cleansing digestion*. Such cleansing digestion can be obtained by treating the wound with hypertonic salt solution. This will, as we have already seen, break down leucocytes, setting free trypsin, and then the free trypsin will rapidly, and especially rapidly if we let the hypertonic salt undergo dilution, amputate the dead from the living tissues. Let us note that what we set out to do by the use of hypertonic salt solution is only to achieve more rapidly, and, as we shall see, with less risk of infection, what putrefaction and the destruction of leucocytes by microbes would, if we allowed things to run their course, spontaneously effect. The *second item* of treatment in each case will be to combat the infection which has found a lodgment in the lymph spaces in walls of the wound cavity. To deal with this we require to wash out by an outpouring lymph stream, and this, as I pointed out a moment ago, is obtainable by treatment with reinforced hypertonic salt solution.

If the train of reasoning I have laid before you is correct, it will follow that hypertonic salt solution is the agent we require both for preventing the set-back due to interruption of treatment in transport, and also for remedial treatment.

EXPERIMENTS WHICH EXHIBIT THE PROPERTIES OF HYPERTONIC SALT SOLUTION.

You will very reasonably here expect me to produce experiments to show that a hypertonic salt solution has the virtues I ascribe to it. You will want to see for yourselves that it attracts water and can draw out fluid from moist tissues; and that it can set free trypsin from pus, and initiate digestion.

Drawing Action of Strong Salt Solution.

I have here (*a*) two cylinders of agar containing salt to saturation and (*b*) two cylinders of water agar—all cast to the same size in 100 c.c. measures, and all rendered insoluble by an addition of formalin. Let us take first the cylinders of water agar. Upon the one of these as it stood in the measure was imposed a little saturated salt solution, solid salt being afterwards supplied as required. You see that the salt has here drawn out water copiously. The agar has everywhere detached itself from the walls, and we have in the interspace and on the top of the cylinder some 40 to 50 c.c. of fluid. The control cylinder of water agar which has been exposed to the air has, as you see, not shrunk at all.

Exactly the converse has happened with the cylinders of salt agar. These were taken out of their moulds: one was put down to steep in water—that one has, as you see, swollen to twice its bulk; the other was immersed in saturated salt solution—that one has not altered in bulk. We thus see that salt attracts to itself water. It can, according to the conditions, draw it out from or into a moist menstruum.

I have here in these three test-tubes another form of moist menstruum—cotton-wool impregnated with egg-albumen. The plug—in each case a very tight plug—is, as you see, placed half way down the tube, dividing it into an upper and lower compartment; and immediately below the plug I have a lateral hole (now sealed with plasticine).[3] Through this hole I can wash out both compartments very thoroughly, and fill and empty them without disturbing the plug. I have used in these experiments three fluids: a diluted egg-albumen with a specific gravity of 1026 for my plug, and two extracting fluids—water, and a saline solution containing about 8 per cent. of common salt with a specific gravity of 1052. In *Tube 1* I have water above and below; in *Tube 2* salt solution above and below; and in *Tube 3* water above and salt solution below. And here are the results obtained 24 hours after by emptying out the fluids and boiling them *secundum artem*. In *Tube 1* we have in the fluid from the upper compartment a mere trace of albumen; in that from the lower a very massive floccular deposit. That means that in the lower compartment the heavier albuminous fluid has sunk to the bottom, and in the upper only a mere trace has diffused upwards against gravity. In *Tube 2*, where both compartments were filled with salt solution, we have in the upper a massive floccular deposit, and in the lower a heavy but not nearly as heavy a one. It is the result in the lower compartment which specially interests us. It shows that an albuminous fluid is drawn down into salt solution in opposition to gravity. In the upper compartment, superadded to the drawing action of the salt, we have a displacement upwards of a lighter by a heavier fluid. In *Tube 3* (see Fig. 11), with water above and salt solution below, the upper compartment contains, as in Tube 1, only a mere trace of albumen. In the lower compartment we have again, as in Tube 2, a very heavy deposit of albumen drawn down against gravity.

I have here other experiments of which I show you photographed drawings. All these bring out that when strong salt solution and water are brought into apposition, and we introduce such a succession of obstacles as are provided by a cotton-wool plug or a wick, we get, so far as the convection of fluids is concerned, the same results as with a thin membrane, such as parchment paper or a film of formalin gelatine. But with respect to the character of the fluid we get a different result. When we employ only very minute pores we filter out albuminous substances; where we employ macroscopic pores albuminous substances are carried through.

In my next experiment (Fig. 12) we have in one beaker saturated salt solution and in the other water coloured with methylene blue. To maintain the fluids at the same level we connect them up with a siphon filled with uncoloured water. We then establish a further connexion by means of a siphon filled with uncoloured water and blocked by a cotton-wool plug at the one end. This end goes down into the salt solution, but it is only just immersed. When we now watch events—and it is a question of watching them for weeks—we find that the coloured water is drawn up into the open limb of the plugged siphon in the manner shown. In the case of the open siphon nothing of this sort occurs.

In the next experiment (Fig. 13) we have a series of three tubes arranged tandem and connected up by wicks of moist bandage fitting very loosely in siphon tubes. We have in Tube A plain uncoloured water, in Tube B water coloured with methylene blue, and in Tube C saturated salt solution—all these being filled in to exactly the same height, and then protected against evaporation. We now observe that the level of the fluid in C gradually rises, while that in A and B sinks; and at the same time the colouring matter from B is gradually conveyed up the wick in the direction of C, but is not carried up in the direction of A.

In the next experiment (Fig. 14) we have again a series of three tubes arranged tandem and connected up by wicks as in the last experiment. In A we have plain water, in B an albuminous fluid, and in C saturated salt solution—all filled in to exactly the same height. As in the last experiment, the level of the fluid rises slowly in C and sinks away

[3] In sealing with the plasticine care must be taken not to produce a positive pressure, and so drive albumen up into the upper compartment.

in A and B. We then unship Tubes A and C, add salt to A, and then boil both. We find that a great deal of albumen has been carried over into C, and that none has diffused over into A.

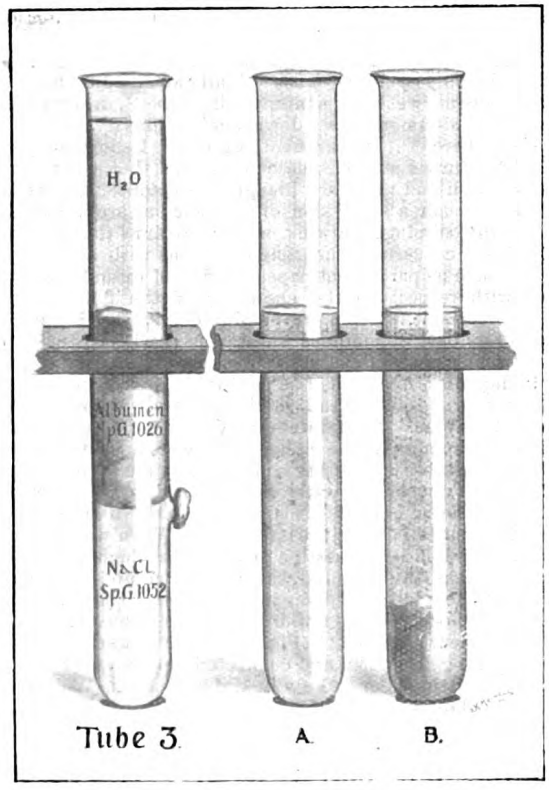
The Setting Free of Trypsin by Hypertonic Salt Solution.

You will probably not want to see any further experiments on this point. But I have still to make good to you that a hypertonic salt solution sets free trypsin from pus and initiates digestion. On that matter I will content myself with showing you the two following experiments.

Experiment 1.—I have here, as you see, two test-tubes filled nearly to the top with egg-albumen. To this was added ½ per cent. of carbolic acid, and the albumen was then solidified by immersing the tubes in boiling water. That done I took two cotton-wool plugs and steeped them in a pus to which I had added again ½ per cent. carbolic acid. I then inverted my tubes, the one into a beaker containing 5 per cent. salt, the other into a beaker containing physiological salt solution. (Fig. 15, A and B.) To these also I added ½ per cent. of carbolic acid. You will understand why I chose carbolic acid as my antiseptic when I tell you that it is an antiseptic which does not destroy trypsin or impede digestion. You see in the drawings made after the tube had been incubated for 48 hours, that in Tube A, the tube which was immersed in hypertonic salt solution, the egg-albumen was extensively digested, while in Tube B there was only a mere trace of digestion.

Experiment 2.—I here try to imitate the conditions of slough-covered wounds. I have in these beakers a foundation of coagulated white of egg containing 0·5 per cent. of carbolic acid. On the top of this I have in each case a

FIG. 11.

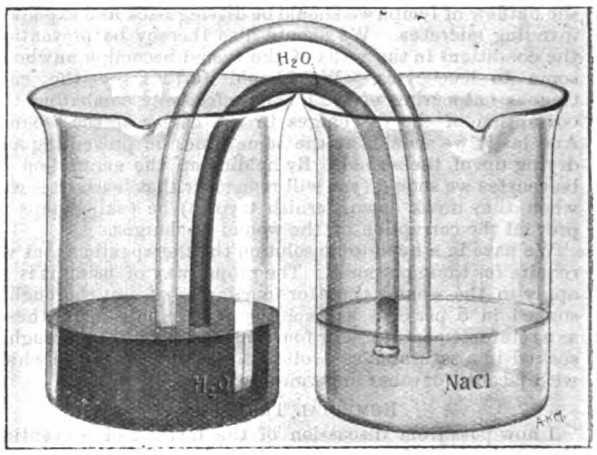


Tube 3 is flanked with test-tubes labelled A and B showing the result of boiling the fluid from the upper (A) and the lower (B) compartments of this tube.

disc of lint, woolly side up, firmly fastened down by adding another layer of egg-albumen and coagulating this by heat. Upon the lint I have poured a non-tryptic pus, giving, of course, an equal amount to each beaker. In this way I have made what I think can pass as representing fairly closely pus-impregnated sloughs in wounds firmly adherent to the tissues beneath. (Fig. 16, A and B.)

We now pour upon one of the artificial sloughs 5 per cent. and upon another 0·85 per cent. solution made up with ½ per cent. carbolic acid, and we may pour upon a third Dakin's solution. And we now place them all in the incubator. You see here what has happened after 24 hours. In *Beaker A*, where the artificial slough has been treated with

FIG. 12.



The left-hand beaker contains water coloured with methylene-blue; the right-hand beaker strong salt solution. The beakers are connected up by two siphon U tubes—the upper being an open siphon filled with uncoloured water; the lower a siphon plugged with cotton-wool and like the upper siphon, filled in at the outset with uncoloured water.

hypertonic salt solution, the slough has loosened itself from its bed, and floats up as I pour in water. In *Beaker B*, where I imposed only physiological salt solution, the slough is still firmly adherent. And the same holds of *Beaker C* (not figured), where we have Dakin's solution.

We have here, as you see, an instructive experiment. And we can derive from it more instruction than has as yet appeared. In the first place, if we carry the experiment further, the slough which has been treated with physiological salt solution will also separate. In contrast with this will be what will happen with the artificial slough treated with Dakin's solution. Here, especially if the Dakin's solution is periodically renewed, the clot will remain adherent. For the Dakin's solution, while it is destructive to leucocytes, is when not quenched by albumen destructive also to the trypsin which brings about the separation of the slough.

We can always appreciate the situation and tell what is going to happen whether in the wound or *in vitro* by taking samples of the fluid and testing quantitatively for trypsin with milk containing about ½ per cent. of calcium chloride cryst., and we can when making experiments *in vitro* on the separation of artificial sloughs, hurry up the events by conducting the digestions at 50° C.

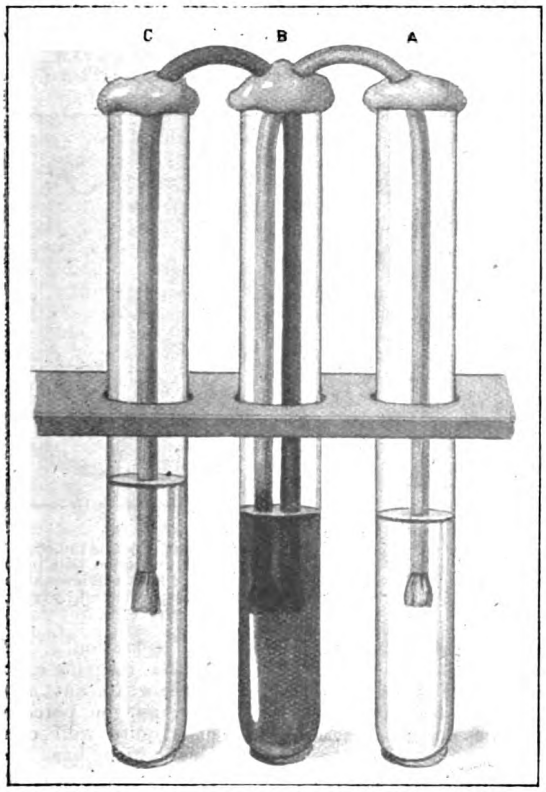
We can also vary our experiment with weak and strong salt solution by leaving out the antiseptic. Then microbic growth will, more particularly in the weaker salt solution, proceed unchecked, and the destruction of leucocytes by that growth will play an important rôle in the loosening of the clot. Meanwhile, the microbes will be everywhere making their way deeply into the albuminous substratum. This imitates what is occurring in every untreated slough-covered wound. While on the surface sloughs are decomposing and separating, in the depth further tissue is becoming heavily infected and gangrenous. In treatment we must combat that inward extension of the infection, and since we cannot block the infection by antiseptics, we must place mechanical and biological obstacles in its path. That means we must get lymph to pour out in full stream from the deeper tissues, and, if we achieve this, we may, after the sloughs have separated, look to have a clean, comparatively lightly infected wound surface.

TREATMENT OF THE WOUND IN THE CASE WHERE WE HAVE ONLY A LIGHT SURFACE INFECTION.

When we have got back to a clean and only lightly infected surface we must think out our next step in treatment.

It will help if we first review what we have learned by the way so as to see the whole history of the wound in perspective.

FIG. 13.



Tube A contains uncoloured water; Tube B, water coloured with methylene blue; and Tube C, saturated salt solution. The fluids stood originally at the same height in each tube.

We have learned that there are in wound infections two supreme dangers. *First*, there is the danger associated with the buried infection. We have appreciated that the effective and only remedy for this is the immediate opening up of the infected dead spaces, and you will remember that is a question of converting a buried infection into an open surface infection. The *second* very serious danger is that intensification of the surface infection which follows upon a lengthy interruption of treatment during transport. This, regarded from the point of view of loss of life and limb, ranks next in order of importance after delay in dealing with the buried infection. When the set-back due to transport has been prevented or remedied, we have confronting us the problem which, if treatment had been uninterrupted, would have presented itself earlier—the problem as to how to treat a slight infection of a naked tissue surface.

One of the ways of treating this is to leave the wound to heal up from the bottom, limiting oneself to such re-dressing as would prevent erosive digestion. By this programme the patient would, when his wound is a large one, be condemned to very many months of disability and also of bacterial intoxication. For the fact has got to be faced that it is all but impossible to maintain satisfactory conditions in a large wound for months on end.

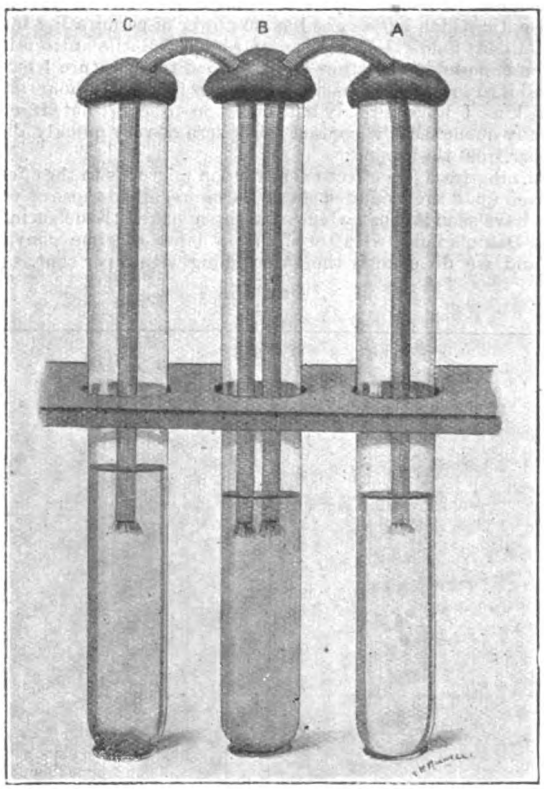
The alternative programme is for the surgeon to close the wound with the minimum delay. If the anatomical conditions permit, and the bacteriological examination shows the wound surface to be practically uninfected, or if the wound is only a very few hours old and the implanted microbes cannot yet have grown out, the wound can, after removal of all dead and foreign matter, be immediately closed—the surgeon, of course, standing by to reopen the wound if symptoms of buried infection develop. If, on the other hand, bacteriological examination shows that the wound surface is appreciably infected, or the history of the case makes this practically certain, then we should, by closing the wound, be violating all the principles of surgery. For we should simply be converting a surface infection into a buried infection. The proper step to take with a wound which is appreciably infected is to reduce the microbic infection to the point at which it is negligible and then re-suture.

Methods of Dealing with the Microbic Infection.

The microbic infection may be dealt with by any one of the following procedures.

In the *first place* we can employ the physiological procedure. If we elect to do this, we must think out clearly the physiological problem. For example, it will be inappropriate when dealing with a purely superficial streptococcic and staphylococcic infection to continue the application of hypertonic salt solution. The effect of that would be, on the one hand, to hold off phagocytes from the microbes (for strong salt arrests emigration); and, on the other hand, to provide the staphylococcus and streptococcus with lymph, a fluid in which they can grow and disseminate themselves over the whole face of the wound. What we want is an application which calls out leucocytes, and which will restrain, or which at any rate will not activate, the lymph flow. Physiological salt solution, and zinc sulphate in ¼ per cent. solution, and no doubt many other heavy metal salts in dilute solution, are the sort of agents we require. But what is, above all, essential to success in physiological treatment of a surface infection is to be very assiduous in removing any leucocytes which may break down upon the face of the wound. That is a question of maintaining intact the antitryptic power of the discharges.

FIG. 14.



Tube A contains plain water. Tube B a watery solution of egg-albumen and Tube C saturated salt solution.

A *second method* of procedure—I may call it the *unreasoning antiseptic procedure*—is to employ an antiseptic, considering in connexion with it only the fact that it is called an antiseptic. That means using an antiseptic without laying stress upon the assiduous cleansing of the wound surface and the maintenance of good physiological conditions; without inquiring whether the antiseptic can, when brought into external contact with pus or an infected tissue, penetrate into it; and without asking whether the antiseptic hinders phagocytosis, or destroys the antitryptic power of the blood fluids, or permits or interferes with tryptic action.

This unreasoning antiseptic procedure is constantly employed. It has led to failure upon failure, and it would be a matter for wonder if it did succeed.

The *third* and last method of procedure I may call the *combined antiseptic and physiological procedure*. If we want to find a method of this sort we shall not find it by inquiring for it under this name. What we have to seek is a method which proclaims itself an antiseptic method and which in this guise combats effectively, but perhaps not with full comprehension, corruptive changes in the wound.

The method of Carrel is, as I think, such a method. I would propose to make good that it is a combined antiseptic and physiological method; then to survey the results obtained; and finally to consider how to determine how far the results should be credited to the antiseptic, and how far to the physiological, element in the treatment.

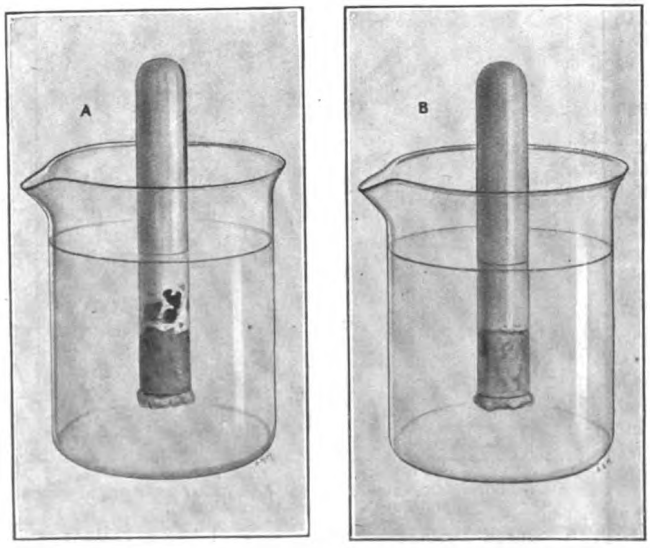
We have in Carrel's treatment two factors: (*a*) Dakin's antiseptic, or, as I should prefer to call it, Dakin's therapeutic agent; and (*b*) Carrel's procedure for washing and refreshing the wound surface in the intervals between the complete dressings. Now each of these factors, quite irrespectively of what it does in killing or removing the microbes, makes the conditions in the wound unfavourable for microbial growth. Let me, taking first Dakin's fluid, and then Carrel's washing procedure, try to make for you an inventory of their directly anti-bacterial, and their physiological or indirectly antibacterial, effects.

Dakin's Fluid.

Dakin's fluid is, as I have shown you,[4] a very ineffective antiseptic when it is brought into application upon microbes suspended in serum. It is also, as I have shown you, an antiseptic which has as good as no power of penetrating into albuminous fluids. It is also an extremely volatile antiseptic. When exposed in a shallow dish at blood temperature I have found it to lose four-fifths of its potency in half-an-hour, and it will, as I have already had occasion to point out, if not already quenched by contact with serum, very quickly disappear from the wound.

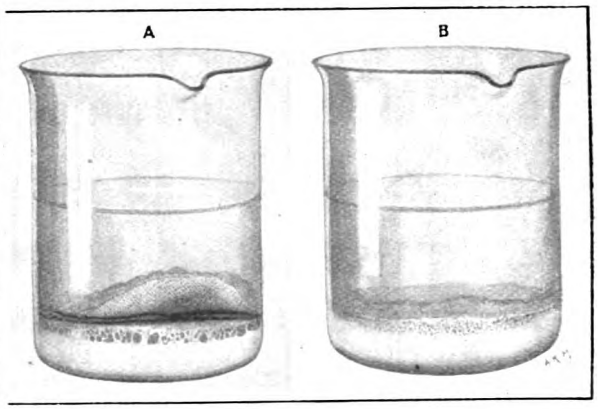
Turning from the effect exerted upon microbes to the effect exerted upon the wound surface, let me recall to those of you who have seen it, that when we treat a naked tissue surface with Dakin's fluid, we after a certain lapse of time convert it (and we do exactly the same thing with 5 per cent. salt solution) into a bright coral-red granulating surface. That means we convert it into a defensive surface excellently well provided with new-formed blood-vessels from which active leucocytes and fully potent lymph will emerge. Leucocytes also are affected by Dakin's fluid. Experiments show that it is destructive to phagocytosis. When we add one part of the reagent to nine of *excoagular blood* we reduce the phagocytic power of that blood by more than one-half. We abolish phagocytosis when we add one part of the reagent to four of blood. The fluid elements of the discharge also are altered in character by Dakin's fluid. Let me remind you here that we saw in our experiments on artificial sloughs that treatment with Dakin's solution hinders the digestive processes which bring about their separation. This stands in relation to the fact that the reagent exerts upon trypsin, when albumen is not there to act as a buffer, a destructive action. We have, as you perceive, here a physiological action which may quite well come into operation when a wound surface which has been tryptic is flushed. But Dakin's fluid will act not only upon trypsin. It abolishes also the antitryptic power of the blood fluids. So, applied in the wound, it might perhaps with one hand give protection, and with the other hand take it away. But what really does happen is, I suppose, that all free trypsin is destroyed by the flush and that afterwards, when the hypochlorite is quenched or vaporised, new antitryptic lymph and with this new leucocytes emerge from the wound surface.

FIG. 15.



Test-tubes filled with coagulated egg-albumen; then plugged with cotton-wool impregnated with pus: and then inverted into beakers. Beaker A contains hypertonic, Beaker B normal salt solution.

FIG. 16.



Beakers containing coagulated egg-albumen into which is imbedded a layer of lint. Upon the lint was poured pus, and upon this in the case of Beaker A hypertonic, and in the case of Beaker B normal salt solution. In Beaker A the artificial slough has separated off by tryptic digestion.

And the particular train of thought here started is, perhaps, worth following up. We may, I think, profitably ask ourselves whether if put to our election between maintaining antiseptic action continuously at the expense of physiological action, and alternating antiseptic with physiological action, we should not do well to elect for the latter policy. And we may muse whether it was not specially felicitous to have employed, as Carrel has done, an antiseptic which is very readily quenched and also very volatile and to have applied it discontinuously. Had that antiseptic been employed by a method of continuous irrigation, phagocytosis on the face of the wound would have been excluded, and we should have had in the cavity of the wound a lymph whose antitryptic power had been destroyed.

But I have already said enough about Dakin's fluid if you have appreciated that it is a poor antiseptic; that it acts as a poison upon leucocytes and blood fluids; that its physiological action is a very complicated one; and that its beneficial effects cannot be due simply to its antiseptic action.

Carrel's Method.

I now come to Carrel's procedure of intercalating between the complete dressings a frequent flushing and refreshing of the wound surface and for carrying out this flushing unlaboriously. Allow me to say that we have here, I think, far the most important contribution made to surgical technique since the beginning of the war. But to that let

[4] Vide supra, Experiments on Antiseptics.

me add, that while Carrel's procedure gives us a new and improved technique for the application of antiseptics, much more does it give us a new and improved technique for physiological treatment. For that treatment the assiduous removal of corrupted and corruptible discharges is, as you know, the primary desideratum.

We now turn to the results of the treatment of infected wound surfaces by Carrel's method, and we may take them from Carrel's book. But it will be well, in order to keep to the kind of wound infection here under discussion, to exclude from consideration wounds complicated with fractures—for in those effective washing is difficult. Within our purview will then only lie wounds of soft parts, and in Carrel's book these are distributed under (*a*) fresh wounds—wounds taken in hand when 5 to 24 hours old; (*b*) phlegmonous and gangrenous wounds; and (*c*) suppurating wounds. The first of these categories would broadly correspond to wounds with a naked tissue surface lightly infected. The others would correspond to wounds which have, through postponement of treatment or its interruption by transport, suffered a set-back, converting an originally light surface infection into a heavy infection with invasion of the deeper tissues. Having now got your bearings, you will see that we have already, in discussing remedial treatment for the set-back, discussed the last two of Carrel's three classes of wounds. And we learn from the data he gives with respect to these only this—that the combined operation of treating the set-back and reducing the remaining light infection to a negligible infection permitting successful re-suture occupies by his method 3 to 4 weeks. This, of course, does not tell us how long it takes to convert a light surface infection into a negligible one. For that we must turn to the data relating to fresh wounds; and under that heading we find that where there are sloughs to be dealt with 15 to 20 days; and, where there are none, 5 to 12 days are required. That gives us a measure of what can be done by what I have, I hope not without good warranty, called Carrel's "combined antiseptic and physiological treatment."

Let us consider what Carrel's results tell us. They tell us in the first place that, whatever else it is, Carrel's treatment is not in any sense a *therapia magna sterilisans*. Regarded as an antiseptic method, it is a method of "*fractional sterilisation*" requiring for the case we are considering—the simplest case of all—at the rate of 12 douches a day a series of 60 to 144 antiseptic douches. And if I am right in regarding Carrel's treatment as a combined antiseptic and physiological treatment, we have, superadded to the antiseptic, a series of 60 to 144 physiological attacks upon the microbes—each such attack starting from an atryptic condition.

The consideration of these figures leads directly to what I have to say in conclusion. While Carrel's work constitutes a very notable practical achievement, regarded as science it comes short in the respect that adequate control experiments are lacking. I do not mean that it has not been demonstrated that Carrel's treatment accomplishes what was impossible by the old system of syringing with antiseptics and leaving the wound afterwards to fill with pus. The inefficacy of that older treatment was attested by tens and hundreds of thousands of control experiments. What I mean is, that we have not in Carrel's work any control experiments with more potent and penetrating antiseptics to negative the idea that with these one could with less than 60 to 144 consecutive douches convert a light surface infection into a negligible one. And again, we have not from Carrel any control experiments with a well-thought-out physiological treatment to negative the idea that one could achieve a similar sterilisation by 60 to 144 successive physiological attacks upon the microbes, starting each time from an atryptic condition.

If we would abide in the spirit of science, every unwarranted assumption must go. We must not assume that when we have successfully combated a surface infection by a series of 60 to 144 therapeutic operations we have reached finality. And much less must we, from the fact that a treatment successfully combats surface infections, infer that it is also an effective treatment for infections which penetrate into the deeper tissues. It ought to come home to us instead that we must never look to find for quite different categories of wound infections—i.e., for quite diverse conditions—any one routine (antiseptic or physiological) treatment.

MASKS FOR FACIAL WOUNDS.

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IN describing the use of modelled masks for covering facial wounds I have to call attention at the outset to two important points: no attempt is made in any of my contrivances for the alleviation of the sufferings of the wounded, to restore functioning or to produce a cosmetic effect by plastic methods.

In certain cases the effects of impaired functioning may be alleviated to a greater or lesser extent, as, for instance, where the nerves affecting the salivary glands have been destroyed, or where the nerves of the eye have been so injured that the control of the tear-ducts is defective and a constant discharge is the result. In such cases I arrange for the attachment of an absorbent pad or pads within the mask which relieve the patients from considerable inconvenience.

Dr. A. Pont, the director of the Dental School of Lyons, in an article in the *British Dental Journal*, deals constructively with the question of nasal prosthesis, and incidentally remarks that "living restorations are indicated for cases of flattened noses, in certain cases of fracture, &c., but cannot enter into account where it is a question of replacing the nose totally or partially."

My work begins where the work of the surgeon is completed. When the surgeon has done all he can to restore functions, to heal wounds, to support fleshy tissues by bone-grafting, to cover areas by skin-grafting, I endeavour by means of the skill I happen to possess as a sculptor to make a man's face as near as possible to what it looked like before he was wounded. My cases are generally extreme cases that plastic surgery has, perforce, had to abandon; but, as in plastic surgery, the psychological effect is the same. The patient acquires his old self-respect, self-assurance, self-reliance, and, discarding his induced despondency, takes once more to a pride in his personal appearance. His presence is no longer a source of melancholy to himself nor of sadness to his relatives and friends.

As a general rule the cases that come to me are those in which the wounds or depredations of disease have been so severe as to remove them beyond the range of even the most advanced plastic surgical operations. So far as my treatment goes the size of the area affected is negligible. In theory it is as easy to make a mask for a whole face as for a space an inch square to cover a small palpitating area such as is often done in the case of skull wounds.

The essential of the treatment is the restoration of features; the features may have been originally ugly or beautiful. As they were in life so I try to reproduce them, beautiful or ugly; the one desideratum is to make them natural. Considerable experiment has proved that only a rigid mask can be depended upon, both for hygienic and cosmetic reasons. Various soft substances, such as gelatine mixtures, have been tried and have failed. Such applications cannot be either healthy or beautiful.

Description of Technique.

In order to approach as near as possible to nature, by my method a casting is made of the patient's face in plaster-of-Paris. This can only be done when the surgeon has discharged him as superficially clean and healed. This cast is essential, for a perfect edge-fit is required, so that adjustment is reduced to a minimum. All wound cavities are filled up with dressing and cotton-wool, and these in turn covered with goldbeater's skin. The nostrils are blocked with cotton-wool, the patient breathing through the mouth; if through the nose a quill is inserted for breathing throughout this operation. It depends on the area of wound, of course, as to whether nose or mouth breathing can be allowed during the process.

Having obtained the mould and dried it slowly the next stage is to French-chalk it and take from it a clay or plasticine squeeze, which provides a positive model of the patient's healed wound and the surrounding normal tissue surface. This model is further developed by means of sittings of the patient, and this stage is completed by taking another cast—a negative.

The task now before the manipulator is to reconstruct the destroyed feature or features from the model taken from this



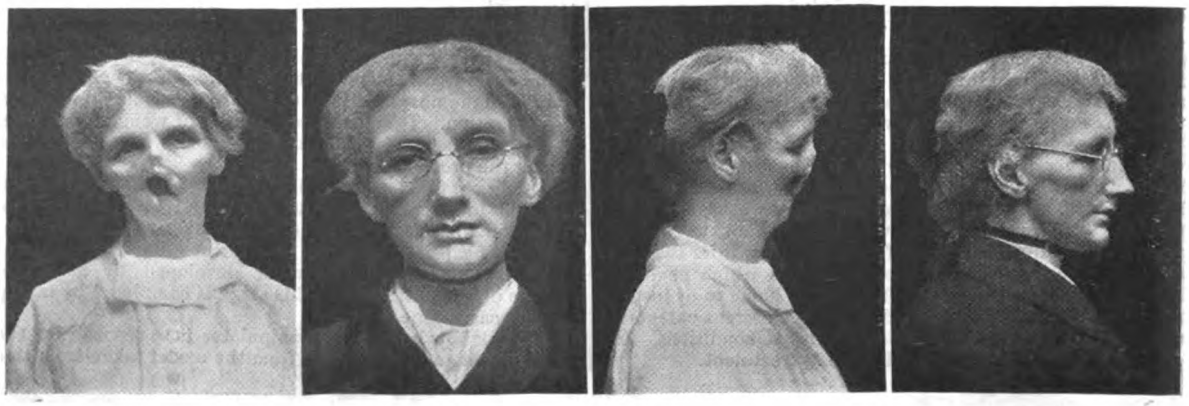
CASE 1.—Artificial pinna.



CASE 2.—Replacement of lost parts by metallic nose.



CASE 3.—Showing artificial nose and cheek, artificial eye, and metallic eyelashes.



CASE 4.—Mask used in case of rodent ulcer.

negative mould, by building them up to match the corresponding or adjoining features of the patient, or from prewound photographs, taking the utmost care the whole time to keep the adjustment of the edges to the patient's face-planes. A cast is then taken of this; further manipulation is required for the fitting of an artificial eye (if the case includes such); a last comparison with the original is made, and the mask, in plaster, is complete.

From this an electrotype plate is deposited. It is of pure copper, 1/32 inch in thickness. The necessary fitments for glass eye and attachments are fixed, and it is finally well covered with an electric deposit of silver.

The last adjustments are now made to the patient's face, the securing of the plate to the face being carefully considered. The attachment is usually made by means of strong spectacles, but spirit-gum and ribbons have sometimes to be used, varying with the character of the wounded area.

The utmost care has to be made in fitting the attachments. I have received great help from Messrs. J. Hamblin, Ltd., the makers of the spectacles, who have devoted special care and attention to the work. Everything depends on the efficiency of the attachments in the matter of comfort to the patient, which is necessary in such cases, so that his attention shall never be drawn to his deficiency unless necessarily. The adjustment must be exact, therefore, and the edges of the plate can in no case be allowed to part from the sections of the patient's skin with which they coincide.

The plate has now to be pigmented to match the complexion of the patient. A thin coating of cream-coloured spirit enamel forms a good basis for the subsequent flesh-colour matching, as it leaves the oil-colour mat when dry, which facilitates the blending of plate with face. If the patient has an oily or shiny skin a semblance is easily obtained by varnish rubbed down to match. I do not use false hair for eyebrows and eyelashes now. The eyebrows are painted to match and the eyelashes I make of thin metallic foil, carefully soldered to the plate, cut finely by scissors, and tinted to match. I purchase the plain glass eye-sections and paint the eye-match on the concave reverse myself. Sometimes I do not use glass at all, but paint a semblance to match direct upon the metal mask, due preparation for this mode, of course, having been made in the plate.

The plate can now be worn and the patient finally discharged. Renewal of the pigmentation must be made from time to time, however, for scar tissue changes the contours of the face, and readjustments must occasionally be made. If these changes are very great a new plate might have to be substituted for the original, but in this only the same difficulties that were met with in the original stage would be encountered.

The Cases Dealt with.

My work has been done in close and constant coöperation with Lieutenant-Colonel Bruce Porter, C.M.G., R.A.M.C.(T.), and the medical staff of the 3rd London General Hospital at Wandsworth. It grew out of the establishment there of the splint room, of which I was in charge, and in which specific splints were prepared for exceptional wounds, and plaster casts taken of all such and kept to form the museum of cases there.

Sir Alfred Keogh, G.C.B., Director-General A.M.D., has directed the staffs of the various military hospitals to place all cases suitable for this treatment at the 3rd London General Hospital, and I am always glad to know of cases from those or other sources in order that all that is possible to be done for the facially disfigured shall be done.

It is obvious that if, in the cases hereafter described, plastic surgical operations could have brought about an endurable result, then such would have been preferable. To wear an artificial substitute for any feature must necessarily be always a burden added to the consciousness of the man or woman so sorely stricken. The fact remains, however, that through lack of time or accommodation in hospitals, or through plastic-surgical failures due to immense pressure of work, cases come out which only the hand of the sculptor can deal with, or hands trained to serve both plastic and sculptural manipulations, or a process combined of both.

In the cases of which particulars are given I have selected three of soldiers and one of a civilian, a woman. The latter I selected for the reason that the ravages of the disease were very extensive, and the surgical operation therefore comprised a considerable area of the lower half of the face, and, further, to note the fact that it is not only the wounded in battle or by accident that may take advantage of this remedial treatment, based on the skill (such as I and others may possess) and the knowledge of the sculptor. On these two things the success of the treatment entirely depends.

CASE 1.—*Injury:* Loss of right pinna by abrasion. The parts torn were so fragmentary as to be useless for a plastic operation. They were cut away, leaving the external orifice only exposed. (The functions of the inner ear are retained.) *Treatment:* A metallic pinna to match the left was modelled. *Attachment:* No mechanical means. Spirit-gum secures a perfect adhesion. The artificial pinna is only liberated with difficulty.

CASE 2.—*Injury:* Loss of nasal bones and cartilages, nasal process of frontal and superficial portions of both zygomatic processes of superior maxillæ. (After healing, by a slight operation, some nasal breathing was restored.) *Treatment:* Modelled metallic nose. *Attachment:* Spectacles, soldered on to the plate at bridge of nose. (Very simple, but quite effective.)

CASE 3.—*Injury:* Loss of nasal bones and upper part of cartilages, part of zygomatic process of superior maxillæ and right eye. *Treatment:* Metallic plate about 4 inches by 3 inches, inclusive of artificial nose and cheek, artificial eye and metallic eyelashes. *Attachment:* Spectacles on plate at bridge of nose, with a pillar fastening the limb of the spectacles to the side of the plate on the cheek-bone. For this extensive plate further security is obtained by the internal pressure of the fleshy terminal remains of the nose which becomes straightened when the mask is worn and fits into the plate. (Due care is taken to prevent discomfort by the pressure.)

Note.—In this photograph a special effort was made to indicate the plate-line (edges of the plate) by placing the camera only 3 feet from the patient. This to exhibit clearly the area covered. As a general rule the edges are not readily apparent.

CASE 4.—*Injury:* Effects of rodent ulcer and treatment. Lower face and nose. Loss of cartilaginous portion of nose, greater portion of alveolar part of superior maxillæ and symphysis menti, including on each side 1½ inches of the rami. (There is no control of salivation.) One aperture only serves the double purpose of respiration and alimentation. *Treatment:* An extensive mask, with modelled nose, lips, chin, &c., from bridge of nose to the cicatrice on neck; laterally fitting under both cheek-bones. *Attachments:* (1) Spectacles (which are detachable) fitting on bridge of nose; and (2) narrow ribbon, slotted through lower section of mask in front of throat, tied at back of neck. (The mask is worn with the greatest comfort and a large wad is fixed in the ample interior space for absorption of the effects of involuntary salivation, giving the patient increased comfort as well as the cosmetic advantage. The patient removes the mask when feeding and uses a feeding-cup.)

ALBUMINURIA IN THE TRENCHES.

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IN view of the investigations on albuminuria and trench nephritis that are now being carried out in casualty clearing stations and base hospitals, the following figures from the records of a field ambulance may perhaps serve a useful purpose.

Many patients are treated entirely in a field ambulance; others stay for several days before being sent down the line. In this field ambulance, during the months of December, 1916, and January and February, 1917, the testing of every patient's urine was adopted as a routine precedure. The results obtained are sufficiently interesting to warrant their being placed on record. In the three months under review all the sick of the division passed through this field ambulance, and the urines of all these patients were tested.

For the purpose of collecting the urine from large numbers pickle-jars were used, and proved very good substitutes for the specimen glasses of the general hospital. With the resources of a field ambulance the tests were simple. Acidulation and boiling, cold nitric acid were the tests used. No microscope, centrifuge, or other apparatus was available.

The following are the figures for the three months. The number of urines tested was 4085; the number of urines

showing albumin was 858 (21 per cent.), made up as follows:—

Showing a trace of albumin	596 (69·5 per cent.)	
,, cloud ,, ...	136 (15·9 ,,)	
In which the urine was loaded with albumin ...	126 (14·7 ,,)	

An attempt was made to ascertain (1) in what percentage of cases the albumin persisted and for how long; (2) what proportion of cases presented renal symptoms; and (3) the relation of patient's temperature to albumin in the urine.

All the cases referred to in this paper are based on observations made during periods varying from two to seven days.

—The figures for February, 1917, alone are given. The number of cases tested was 1442; the number of cases showing albumin was 310 (21·5 per cent.), made up as follows:—

Showing a trace of albumin	225 (72·6 per cent.)	
,, cloud ,, ...	56 (18·1 ,,)	
In which the urine was loaded with albumin ...	29 (9·4 ,,)	

1. *In what percentage of cases albumin persisted and for how long.*—Of these 310 cases, (*a*) albumin disappeared from the urine in 132 cases (42·5 per cent.), made up as follows:—

On the second day in 72 cases	54·6 per cent.		
,, third ,, 30 ,, ...	22·7	,,	
,, fourth ,, 12 ,, ...	9·1	,,	
,, fifth ,, 13 ,, ...	9·9	,,	
,, sixth ,, 2 ,, ...	1·5	,,	
,, seventh ,, 3 ,, ...	2·3	,,	

One hundred of these patients returned to duty, their urine having been clear of albumin for three days. Up to the time of writing (March 25th) there have been no readmissions for albuminuria, and although some of them have been re-admitted for various diseases, no albumin has been found in their urine.

I have been unable to trace the remaining 32, as they were evacuated to a casualty clearing station with various diseases—P.U.O., bronchitis, trench feet, &c.

From the above table it is seen that of the 310 patients in whom albumin was found on admission 132 cleared up within seven days, and of these 132, 100 returned to duty.

None of these patients presented any renal symptoms and only very few any constitutional symptoms. They were mostly cases of inflammatory connective tissue, scabies, impetigo, dental caries, laryngitis, &c.

(*b*) One hundred and seventy-eight cases in which albumin persisted in the urine while in the field ambulance. These cases were evacuated to a casualty clearing station, after periods varying from two to seven days, for P.U.O., bronchitis, pneumonia, &c., or albuminuria. Albumin persisted in the urine.

On the second day in 82 cases	46·1 per cent.		
,, third ,, 28 ,, ...	15·7	,,	
,, fourth ,, 12 ,, ...	6·7	,,	
,, fifth ,, 14 ,, ...	7·9	,,	
,, sixth ,, 23 ,, ...	12·9	,,	
,, seventh ,, 19 ,, ...	10·7	,,	

From the above table it will be seen that albumin was still present on evacuation to a casualty clearing station in 178 out of the 310 cases showing it on admission—i.e., 57·4 per cent., or 12·3 per cent. of the total patients admitted to the field ambulance for the month.

I have traced these 178 cases to the casualty clearing station, and find that 90 (50·6 per cent.) were transferred to base by hospital train as albuminuria or nephritis after a stay in the casualty clearing station of from two to eight days. The remaining 88 I have also traced and find that they were evacuated to the base with other diseases, P.U.O., bronchitis, pneumonia, &c. I have been unable to find whether albumin was present in the urine when leaving the casualty clearing station or not. None of these 88 patients presented renal symptoms while in the field ambulance.

2. *What proportion of the cases admitted with albumin in the urine presented renal symptoms.*—Of the 90 cases evacuated to the base with the diagnosis of albuminuria or nephritis 40 presented no obvious renal symptoms except in some cases a persistent albuminuria which increased from trace to cloudy, although on a milk diet; some cleared up on milk, but relapsed at once on being given meat.

Fifty patients showed distinct renal symptoms whilst in the field ambulance. A short account of their condition follows.

History.—Four patients suffered from renal disease in civil life. One patient had been in the ambulance three weeks previously with trench fever, and then had a trace of albumin which persisted for two days. He was discharged on the eighth day apparently well. The majority of patients gave no history of previous illness.

Onset.—Rapid. In most cases patient stated he had been feeling ill for about 2-5 days. The first thing usually complained of was pain in the back and legs, then shortness of breath and puffiness of the legs and face. In four cases the reddish colour of the urine was the first thing noticed.

Symptoms.—There occurred in the following order of frequency: Bronchitis, 16; swelling of feet and legs, 14; hæmaturia, 13; shortness of breath, 12; headache, 6; frequency of micturition, 5; vomiting, 2; and cyanosis, 2. Some patients had only one or two of these symptoms, others more.

Urine.—In 23 patients the urine was loaded with albumin.
,, 26 ,, ,, ,, cloudy.
,, 1 ,, ,, contained a trace.

Temperature.—This was raised in 23 cases, normal or sub-normal in 27.

Cardiac changes were observed in 2 cases.

Two cases died. Both presented while in the field ambulance symptoms of uræmia, with cyanosis of a grey type.

The length of service in France of the 50 cases showing renal symptoms is as follows: Up to 3 months, 16; 4 to 6 months, 8; 7 to 12 months, 15; 12 to 24 months, 11.

The age incidence of the 50 cases showing renal symptoms is as follows: 18 to 25 years, 28; 26 to 30 years, 8; 31 to 35 years, 7; 36 to 40 years, 4; and 40 years and over, 3.

The majority of the cases were infantry serving in the trenches. The average per battalion was 4. A pioneer battalion gave the greatest number of cases—i.e., 6; the A.S.C. furnished 3, Division Ammunition Column 3, R.A.M.C. 3.

3. *Relation of patient's temperature to albumin in the urine.* (From the charts of cases which remained in the field ambulance for four days or more.):—

	Cases.
Patients' temperatures normal during stay in hospital (albumin disappeared within 7 days)	65
Patients' temperatures normal during stay in hospital (albumin remained)	47
Patients' temperatures fell to normal (albumin disappeared) ...	38
Patients' temperatures fell to normal (albumin remained) ...	31
Patients' temperatures remained high (albumin disappeared) ...	21
Patients' temperatures remained high (albumin remained) ...	20
Total	222

Albumin was found in 25 per cent. of the cases of P.U.O. admitted during the month of February, 1917.

Conclusions.

It is extremely difficult to draw any conclusions from the work done in a field ambulance, as the facilities are few and the time for observation limited. A few points and suggestions, however, may be helpful to others who have better opportunities for research.

One point impressed on the author during the past three months is the importance of testing the urine of every sick man.

Of the 50 severe cases referred to in an earlier part of the paper only 15 presented symptoms sufficiently obvious to enable the diagnosis of albuminuria to be made before reaching the ambulance. The remainder were admitted with other conditions, such as P.U.O., bronchitis, inflammatory connective tissue, tonsillitis, or even scabies.

I have also been struck by the large number of patients who, without renal or constitutional symptoms, show a trace of albumin in their urine. These cases are sent in to the field ambulance for complaints which do not seem to bear the slightest connexion with albuminuria—e.g., hernia, flat feet, varicose veins, scabies, impetigo, dental caries, and minor septic conditions. Some of these cases give a trace of albumin for a few days, which clears up under treatment and does not recur. The condition does not seem to bear any relation to the severe type of albuminuria, for of the slight cases which cleared up while in the ambulance and returned to duty only one has been readmitted. In this case the urine was loaded with albumin on readmission. This mild albuminuria is also met with in officers; 32 per cent. of those admitted showed albumin, but no case showing renal symptoms has been observed in the three months. In all cases amongst officers except two the albumin cleared up in a few days. This mild albuminuria appears to be physiological, possibly due to the conditions of life in the trenches, where excessive ingestion of protein, excessive fatigue, and exposure are common.

As regards the relation of temperature to albuminuria I have not been able to draw any definite conclusions. Patients

with a high temperature seldom have albumin, whilst those with lower temperatures frequently have. The true febrile albuminuria of the text-books, where the albumin disappears with the fall of temperature, has not often been seen, the temperature often falling while the albumin remains, and *vice versa*, in a most bewildering fashion.

That there is a definite trench nephritis there is no doubt in my mind, possibly an infective condition similar to the acute nephritis of civil life, but the anæmia does not seem to be so common. Suppression of urine has not occurred in any of the cases under observation. The respiratory system seems to be first attacked.

Cardiac changes have not been observed. With the resources at my disposal I have not been able to classify the severe cases, but I feel sure that they could be grouped in some such manner as: (1) Cases of old nephritis awakened again by climatic conditions in the trenches; (2) cases of acute nephritis which would have occurred in civil life; and (3) cases of trench nephritis.

It is hoped that this paper will prove some stimulus to the further investigation of albuminuria in the field, as the foregoing figures show that patients suffering from various ailments are frequently found upon examination to be suffering from albuminuria, which in many cases gives rise to no symptoms.

A UNIVERSAL ARM-SPLINT.

BY GEO. EWART WILSON, M.B. TOR., F.R.C.S. ENG.,
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THE surgeon who has had to treat many cases of compound fracture of the humerus with suppuration must have felt how unsatisfactory were any of the splints at his disposal, and it was such a feeling that induced me to endeavour to work out a splint which should at any rate approach the ideal. It is not my purpose to discuss in any way the various splints in use at the present time, but simply to describe as briefly as possible the methods I employ.

The splint is made of a single rod of one-quarter inch round malleable iron, about seven feet long. It should not bend too easily, and is twisted cold. For descriptive purposes it may be divided into a chest-piece and an arm-piece. (See Figs. 1 and 2.) The former is shaped like the letter "W," and as it is the part which is attached to the chest wall, its curves conform to the antero-lateral outline of an average thorax. The latter consists of two limbs, an anterior and a posterior. The anterior turns immediately downwards and a little forward, with a fairly sharp bend at an angle of about 30°, forming the inner bar; and at a place corresponding to the bend of the elbow, turns directly inwards as the upper bar. The posterior passes outwards at right angles to the plane of the chest-piece, forming the projecting bar, until it reaches the level of the plane of the anterior arm, when it turns downwards parallel to the inner bar, forming the outer bar. Below the elbow it turns inwards as the lower bar, and at a suitable spot turns upwards to join the extremity of the anterior limb as the end bar. The measurements of the various parts of the arm-piece are as follows:—Projection bar, 6½ in.; inner bar, 5½ in.; outer bar, 13 in.; upper bar, 10 in.; lower bar, 16 in.; end bar, 4¼ in.

FIG. 1.



Chest-piece.

While it is desirable to have a war splint as simple as possible, it is very apparent that the model described may be modified. For instance, there might be a lock-joint where each limb joins the chest-piece; or steel might be used to replace the malleable iron, but for the universal use the latter is preferable, because once the plaster is firmly set, the position of the splint can be changed by simply bending it where the anterior and posterior limbs join the chest-piece, provided, of course, the material is of the proper strength.

FIG. 2.



Arm-piece.

The splint is applied as follows:—

The patient stands, or is seated on a high stool with a foot rest. A tight-fitting vest (undershirt), with the sleeve cut away from the side corresponding to the fracture, is put on and the fractured arm is held forward by an assistant, while he rests his good arm on the assistant's shoulder. It is important that the patient stand or sit erect with the shoulders in a position of rest, so that when the arm is applied to the splint the parts are in a natural posture. Three 3-inch plaster bandages are put round the chest, reaching into each axilla as far as one can comfortably go, and embracing the lower borders of the ribs in the axillary line. These must be put on snugly, for if loose, the cast will be uncomfortable. Now apply the splint, taking care that the plane of the arm-piece is directed forward, and the upper ends of the "W" are about the level of the top of the plaster. In this position try the arm, and if the elbow is going to be too near the lower bar, pull the chest-piece a bit lower. The arm is again held aside, and while an assistant holds the splint in position, some plaster cream is rapidly rubbed about the "W," and then two or three more bandages are applied. By the time a small crescent-shaped piece of plaster is cut away from each axilla, the splint should be fairly well fixed, and ready to support the arm. While the plaster bandages are being applied, shoulder-straps of adhesive strapping about three inches wide and having a pad for the protection of the clavicle are incorporated.

The flannel slings previously fixed to the splint are brought into position and the arm placed upon them. Extension is applied by adhesive bands front and back and attached to the lower bar. If the splint has been properly applied the humerus is directed downwards and slightly forward and the forearm across the body with the hand grasping the end bar. If there is any danger of pus tracking up towards the shoulder when lying down the patient is preferably put upon a Gatch frame.

The advantages of this method are manifold: it is simple, cheap, quickly made, and readily transported. Once applied it will remain in place for weeks without further attention. The whole weight of the limb is borne by the trunk, so that the shoulder-girdle is relaxed. It gives fixation of the fragments which is permanent and as much or little extension—for with a relaxed shoulder very little is required—as is desirable, without any pressure whatever upon the axilla. While designed for the humerus, it is just as applicable for the forearm, in which case the extension is made from the lower end of the outer bar; and if it is necessary to have the hand supinated the upper and lower bars can be twisted accordingly. Correct alignment is readily obtained, for the whole arm is exposed to anterior

and lateral views. The space between the bars is sufficient for the wounds to be easily and quickly dressed and with the minimum of pain, because the forearm remains fixed. The patients are comfortable, and unless otherwise contra-indicated they are free to move about at will, and whether up or lying down there is no change in the support of the arm, since the flannel slings run parallel to the transverse diameter of the body. The nursing is reduced to a minimum, and if the patient must remain in bed he is as easily managed as one with a septic arm but without a fracture. While one model for each side suffices. it is more convenient to have different sizes, but in a short man the splint is put on high up, while in a tall man lower down. It can be made anywhere, as any surgeon with a hammer and anvil should experience no difficulty in turning out a model from which as many as desirable may be made.

I have at present a leg-splint based on the same principle —namely, the permanent fixation of the splint to the trunk, so that the limb is applied to the splint and not the splint to the limb. In the near future I propose describing it in detail.

I would like to thank Lieutenant-Colonel W. B. Hendry for the kindness shown me. He has given me every opportunity to use his patients to experiment with the splint, and, in fact, it was upon a patient of his that I fitted my first model.

TEMPORARY "PILONS."

BY DR. A. H. BIZARRO,

LATE INTERNE OF THE LISBON HOSPITALS; ASSISTANT SURGEON TO WELSH METROPOLITAN WAR HOSPITAL, WHITCHURCH, NEAR CARDIFF.

THE word "pilon" is used in French-speaking countries for pestle or stamper. It means, from an orthopædic point of view, any device of prosthesis to enable cases of amputation to use their stumps for deambulatory purposes. Considering the great number of amputations during the war, and the drawbacks of keeping patients without using their stumps before being fitted with artificial limbs, any temporary appliance to enable patients to walk while awaiting complete healing of the stump and all other details required

FIG. 1.



Temporary pilons as applied to amputations through the thigh.

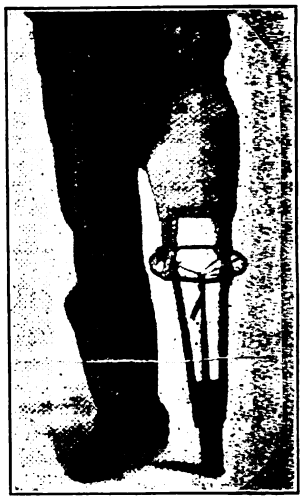
for the application of a definite artificial apparatus, would be of great practical use. Professor Depage and Dr. Martin (Belgium) were in their clinic among the first to make use of temporary pilons in these cases.

It is unnecessary to state the disadvantages of keeping an amputated limb in disuse for a prolonged period. The stump is liable to various types of deformities impairing the function of the joints, to œdema, terminal adhesions of the scar, hypersensibility, &c. The use of crutches may not only provoke and accentuate all these alterations, but will give rise to postural deformities of the body by reason of deviation of its gravitation centre as a whole. Besides, crutches can give rise to various inconveniences by pressure on vessels and nerves in the axillary region and on the points of contact of the hand due to grasping the handle.

Any temporary device that allows such cases to walk soon after the amputation has advantages which can be easily foreseen. The cicatricial processes are quickened, the stump gets used sooner to its proper work, the stay of the patient in hospital as a convalescent is shortened, and the definite artificial limb can be applied in much better conditions for a quick practical success, saving most certainly a sum of money in the great majority of cases. Besides, the pilons I have made can last several months in good condition for daily use.

The material required consists of a wooden frame, easily made, poroplastic, webbing, plaster, bandages, and a little felt. The first step in applying a pilon is to make a mould of the stump with poroplastic. With the patient standing (particularly in thigh cases) on the sound leg the bony tuberosities should be well marked, and the upper end of the first layer well adapted to them so as to support the weight of the body in walking. The lower end of this first layer, in the great majority of cases, is left open, and all the support of body takes place on the superior part of the tube.

FIG. 2.



The temporary pilon with extension applied.

Having moulded and fixed this inner coat of the pilon, keeping it very smooth on its inner face, it is covered with a few layers of plaster. Then, having tried it well on the patient, the wooden frame is measured, allowing for the heel of the boot, and is fixed to the inner cylinder by means of plaster. Webbing pieces are included in it, and when the plaster is dry, the inner cylinder is fixed to the frame by means of screws or rivets to make the whole more solid. For stumps of the thigh felt only is used on the upper part of the poroplastic, and I must emphasise that in these cases the bottom of the cylinder is entirely open.

To avoid softening of the structure of the cylinder due to perspiration, particularly in warm weather, holes of 5 cm. diameter can be drilled through the supporting belt which at the same time makes the pilon lighter.

The cheapest form of wooden frame is a short cylinder 5 to 10 cm. long and 5 to 7 cm. in diameter according to site of amputation, with two bars of different length on either side of it. These are fixed to the former by screws, and the "heel" can be covered by a circular rubber heel or a piece of leather.

Short stumps of the thigh require a long outer wall of the pilon, and good fixation to the trunk by means of a lateral bar of iron. I have a special design of articulation which has not yet been tried in this service. For short stumps of the leg good results are usually achieved by making a secondary cylinder for the thigh and fixing it to the lower one by a bilateral articulated piece opposite the knee.

Patients fitted with pilons are allowed to walk, using walking-sticks, and in a short time they recover good co-ordination of movements and muscular power of the stump, getting about without any manual means of support. In cases requiring extension of the soft parts this can be applied to the lower end of the pilon by means of an india-rubber tubing. (Fig. 2.) When the patient goes to bed it can then be applied to the weight as in the usual cases. The photographs reproduced elucidate the pilon better than any detailed account.

These temporary pilons cost very little, and as a rule last for a very long time. When the stump gets thinner the bucket can be made to fit the thigh better by a thin layer of felt conveniently applied on its inner surface. The appliances save time, give great moral comfort to the patients, and in the long run save money, not only as regards the fitting of the definite artificial limb, but also in diminishing the period of in-hospital treatment. In a word, they make the cases more anatomical in a shorter period of time. I have a similar device for the upper limb which has not yet been tried in this country.

My thanks are due to Lieutenant-Colonel E. Goodall, officer in command of the Welsh Metropolitan War Hospital, and Lieutenant-Colonel Lynn Thomas, C.B., C.M.G., consulting surgeon, who introduced the pilons into the hospital, and to Mr. Geary Grant, the surgeon, whose cases kindly were given to me for the carrying out of the work.

A CASE OF

PHARYNGEAL DIVERTICULUM.

BY JAMES McCLURE, M.D. GLASG., F.R.C.S. ENG.,
ASSISTANT SURGEON, LONDON TEMPERANCE HOSPITAL.

I DESIRE to draw attention particularly to two points of importance in the diagnosis of pharyngeal diverticulum. In the first place, in a suspected case, where a negative radiographic examination has taken place, undue weight should not be attached to this, but further examinations should be carried out subsequently and attempts made to imitate the average consistency of the regurgitated material in preparing the opaque meal. Secondly, though the natural secretion from the mucous membrane of the pharynx and œsophagus is alkaline, yet food retained in a pharyngeal pouch may rapidly decompose, and a strongly acid reaction therefore should not lead one to conclude that the regurgitated food must have come from the stomach. The acidity in the following case was due to lactic and not to hydrochloric acid.

A. B., aged 44, consulted me on Feb. 8th last on the advice of his medical attendant. He stated that, at intervals varying from 2 to 24 hours after swallowing food, regurgitation of small particles took place into his mouth. This was painless, unassociated with effort or nausea, and had occurred at irregular intervals over a period of at least three years. In addition, for the last two or three months he had been troubled occasionally with "sour mouthfuls" and a bad taste in his mouth. His doctor told me that he had been radiographed for a pharyngeal pouch with negative results, that the regurgitated food had invariably been found to be strongly acid, and that after the passage of bougies under an anæsthetic a diagnosis of œsophageal spasm had been offered by the surgeon who saw him at that time.

Previous history.—He had had no previous illness of any importance, gave no history of syphilis, and had always led a careful and abstemious life; but he worried about trifles, he said, and remarked that his present disability was more pronounced when he had had more worry than he could "shake off." His teeth, which had always been bad, were extracted nine years ago and replaced by dentures. Even then, however, he never masticated his food thoroughly, and especially during the last two years he used to bolt his food in consequence of increased work and hurried meals.

History of present condition.—During the winter of 1914–15 he had been singing more than usual, and in his professional capacity had put such an extra strain upon his voice that he had to consult a laryngologist about a dry and painful throat. On that occasion he spoke for the first time to any doctor about the return of food into his mouth. He did so because he felt there was some "slight stoppage just behind the throat," and thinking this stoppage and the soreness of the throat were due to one and the same cause he concluded that the throat examination would show what was wrong. Under treatment his throat symptoms improved, but the regurgitation of food persisted. As this was painless, he waited till May, 1916, when a recurrence of throat trouble made him consult his doctor, who told him that he probably had a pharyngeal pouch and advised him to see a surgeon. He did so, and after examination was told he was suffering from "nervous spasm of the muscle."

Examination.—I saw the patient with his doctor on Feb. 8th. In addition to the history given above, he told me that mouthfuls of a white frothy substance used to enter his mouth with a gurgling noise, especially when he stooped down to tie his shoe-laces in the morning. He had no difficulty in swallowing liquid or solid food; but he felt as though some food "lodged" or stuck at times just behind his throat. He had not noticed that this occurred with his head in any one position more than in another. After a violent fit of coughing or hawking of mucus, food used to regurgitate more freely. Currants, haricot beans, sardine and aperient pills were the most likely to "lodge and come back." In ordinary social intercourse he was always apprehensive of regurgitation taking place accompanied by gurgling noises. Eighteen months ago he weighed 11 st.; his weight was now 10 st. 3½lb.

External examination revealed no fullness of the neck except for some slight enlargement of the thyroid gland. In examining this a gurgling noise was heard inside the mouth. This was repeated when holding the tongue forward in the course of an examination of the larynx. This gurgling could be heard distinctly some yards away: it lasted about five seconds and was apparently due to the escape of gas from his pharynx; the gas was odourless. A full-sized gum-elastic bougie was passed into the stomach without difficulty, but shortly afterwards the soft tube of a Senoran's aspirator was arrested about 7 inches from the teeth. A provisional diagnosis of pharyngeal diverticulum was given and operative treatment for its removal was advised if X ray examination confirmed the diagnosis.

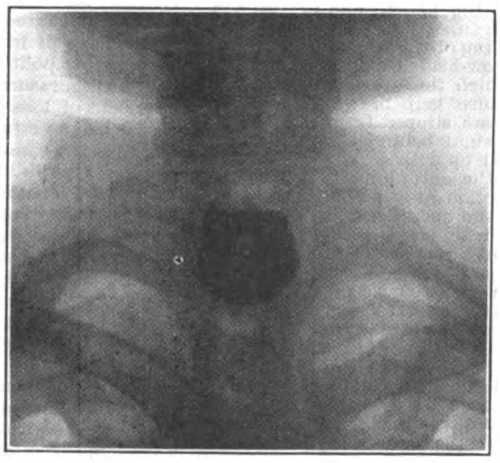
X ray examination.—The patient was X rayed by Mr. Archibald Reid on Feb. 12th. About 8 ounces of barium emulsion were prepared and specially made of a thicker consistency than usual. While the patient lay on a couch in a semi-recumbent posture he was told to swallow half of the emulsion slowly and in small quanties at a time. Five minutes afterwards he was allowed to get up and was then screened in the right oblique and postero-anterior positions.

In the right oblique position nothing abnormal was seen at first in the region of the pharynx or œsophagus. A bismuth cachet was swallowed and this rapidly traversed the gullet and reached the stomach without delay.

More emulsion was given and in the postero-anterior position a small crescentic shadow was observed behind the tracheal rings. Though the pouch contained but a small quantity of emulsion, the shadow cast by the barium could be seen rising and falling with every effort at deglutition. Sufficient evidence was thus obtained to confirm the clinical diagnosis. It was now possible towards the end of the examination to see the shadow in the right oblique as well as in the postero-anterior positions. A subsequent attempt was made to fill the sac more completely. This succeeded, and Figs. A and B are the appearances seen in the skiagrams. It will be observed that the lower margin of the shadow reaches to the level of the body of the second dorsal vertebra.

Skiagrams showing Rounded Outline and Broad Pharyngeal Attachment of Pouch.

FIG. A.



Postero-anterior view.

FIG. B.



Right oblique view.

Operation on Feb. 18th.—Intratracheal insufflation of ether was carried out by Dr. Howard Jones, and with the assistance of the patient's doctor and Mr. Neil Sinclair the œsophagus was exposed by an incision along the anterior border of the left sterno-mastoid muscle from the sterno-clavicular articulation to the upper border of the thyroid cartilage. A distended anterior jugular vein, which appeared to lie farther from the middle line and to cross below the sterno-mastoid at a higher level than usual, was cut between two ligatures. The sterno-mastoid muscle with the carotid sheath was drawn outwards, exposing the infrahyoid muscles. The anterior belly of the omohyoid was divided, and its nerve of supply

from the ansa hypoglossi was seen entering its deep surface towards the posterior border. Retraction inwards of the sterno-hyoid and sterno-thyroid muscles showed up the pretracheal layer of fascia which was very well marked. Division of this enabled the lobe of the thyroid to be displaced towards the middle line, exposing a cavity in which the finger recognised the vertebræ posteriorly and the cricoid and tracheal rings anteriorly. A strand of fibrous tissue prevented complete retraction forwards of the thyroid. This contained the inferior thyroid artery, which was isolated by blunt dissection. After division of its upper and lower branches between two ligatures complete dislocation forwards of the thyroid lobe was possible. A 10-volt Clar's forehead lamp was found useful at this stage. Embedded in the pale pink areolar tissue of the depth of the cavity a thicker and more substantial-looking structure could be seen distinctly. It was white with rounded outline and proved to be the pouch.

A full-sized stomach-tube was passed into the stomach and left in position till the operation was completed. Alongside this an ordinary gum-elastic catheter was introduced and, guided by the finger in the wound, was coaxed into the diverticulum. This helped to demonstrate its size and rendered easier the separation of the sac, while the stomach-tube acted as a guide for its complete isolation right up to its junction with the pharynx. No inflammatory adhesions were encountered and the pouch was easily freed by blunt dissection from the surrounding tissues. There was no displacement of the carotid sheath and, with the exception of the slight irregularity in position of the anterior jugular vein (noted above) and some enlargement of the lobe of the thyroid gland, no anatomical peculiarities were noted. The œsophagus was freed to some extent from the loose areolar tissue over the longus colli muscle, and in this way the pouch and adjacent part of the gullet were brought as near as possible to the surface of the neck wound. The pouch was more or less globular, semi-collapsed, and about the size of a golf ball. It was attached to the middle of the posterior surface of the pharyngo-œsophageal junction, about the level of the cricoid cartilage. Its communication with the œsophagus was not narrowed down to form an isthmus, but was relatively wide and open, measuring about 1 inch in vertical diameter. No stricture was seen in any part of the œsophagus so far as this was exposed from the cricoid downwards. In isolating the sac some of its contents were expressed into the pharynx, but aspiration of any septic material was effectually prevented by the steady expiratory current of air alongside the intratracheal catheter.

The catheter was now withdrawn from the pouch, and after packing off the cervical tissues with gauze the diverticulum was removed. To prevent any soiling of the wound this was done between two pairs of narrow-bladed clamp forceps, but owing to the tension with which the sac was brought to the surface and to the insecure grip of the proximal pair of forceps the stump of the sac slipped from between the blades and retracted out of sight behind the gullet. Each end of the opening was picked up with a pair of Porrier's forceps, and this made easier the only difficult part of the operation—namely, the introduction of a double layer of continuous catgut suture to close the opening. On account of the depth and narrow space in which one has to work, a Killian's nasal septum needle might prove useful in introducing these sutures in any similar case. The first row of sutures took up the mucosa, while the second buried the first by approximating the fibrous and muscular coat. Finally, two or three points of interrupted suture were inserted, bringing down the lower fibres of the inferior constrictor of the pharynx to reinforce the upper angle of the wound. The wound was cleaned and wiped dry and a medium-sized rubber drainage-tube was placed down to the suture line in the œsophagus and brought out at the lower angle of the wound. The cut margins of the platysma were approximated with interrupted catgut sutures and silkworm gut brought the wound together except where the tube emerged below. With the exception of these silkworm gut sutures catgut ligatures were used throughout. The stomach was washed out through the stomach-tube, and the latter was then withdrawn.

For the first two days the evening temperature registered 100° F. Its highest point thereafter was 99° F. and by the end of the first week it was normal. The drainage-tube was removed on the fourth day and replaced by a light gauze wick, which was discarded on the tenth day. No food fistula developed and the sinus gradually closed down. For the first four days nothing was given by the mouth, which was constantly rinsed with glyco-thymoline mouthwash. During this time salines and glucose were given per rectum, and on the fifth day sterilised milk, raw meat juice, and chicken jelly were allowed. The amount and frequency of oral feeding were gradually increased, when it was seen that no leakage had occurred, and when he left the nursing home for Brighton at the end of the third week he was taking solids easily and with comfort.

I am much indebted to Captain C. Rhodes Harrison, R.A.M.C. (T.), who sends the following histological report of the diverticulum:—

"On section two small ulcers were found each about the size of a threepenny-piece and in the removed position they were in apposition. They showed loss of epithelium, the bases being formed of firm connective tissue in a condition of subacute inflammation. The epithelium throughout was of the type normal to the œsophagus. In no place was there evidence of peptic or other glands and there was no keratin formation. The wall showed a fairly firm fibrous connective tissue with very scanty and isolated groups of muscular tissue."

Mr. John Webster, F.I.C., of the Laboratory of Pathological Chemistry, St. Mary's Hospital, kindly analysed the contents of the pouch. He reports as follows:—

"The filtrate was strongly acid to litmus, but gave no acid reaction with dimethylamidoazobenzene nor with Gunzburg's reagent. The acidity was due not to mineral acid but to organic acid or acid salts. The liquid gave a marked reaction for lactic acid. On examination for ferment activity I found no evidence of the presence of pepsin or pepsinogen."

Harley-place, W.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OPHTHALMOLOGY.

Discussion on the Etiology and Treatment of Iritis.

A MEETING of this section was held on June 13th, Mr. WILLIAM LANG, the President, being in the chair.

The PRESIDENT made touching reference to the demise of Mr. Walter H. H. Jessop, who was at the time of his illness acting as honorary librarian to the Bowman Library and had expressed his intention of making the library as perfect as possible. Owing to the generosity of Mrs. Jessop the deceased Fellow's books had become part of the library, and for this all ophthalmologists had cause to be grateful.

In initiating the debate on the Etiology and Treatment of Iritis, the PRESIDENT said that its opportuneness lay in the fact that if Fellows could agree as to the cause of the disease in the majority of cases of iritis they would be in a strong position should it appear politic to advise the proper authorities to introduce such measures as would prevent much ill-health, a great amount of loss of sight, and untold injury to the community. He had ascertained that in 200 cases of iritis in his private practice the various causes occurred in the following percentages: syphilis, 6; gonorrhœa, 12; tubercle, 11; general affections, 8·5; other causes, 25·5; pyorrhœa, 37. At one time, syphilis was regarded as the chief cause of iritis, and probably hospital figures would show an increase on 6 per cent.; but with the modern anti-syphilitic methods he thought it would become the rarest cause, for gummata of iris and ciliary body could be made to melt away without the disorganisation of the eye which was formerly seen. Gonorrhœa was not usually considered so potent a cause, but hospital practice would probably show a higher percentage than 12. Until recently Mackenzie's work on gonorrhœal iritis had remained unimproved upon. Now, however, that the infection had been shown to linger in the genito-urinary system for years relapses could be largely prevented by local treatment applied in that region. Other sources of infection might complicate the cases of iritis, such as pyorrhœa, and produce relapses. The tuberculous cases of iritis were equally divided between the sexes, and the average age of the patients in this form was 25 years, all but two being between 16 and 35 years of age. The treatment of tuberculous iritis, as for tubercle of the lung, appeared to be good air, graduated exercise, and food rich in fats, as well as such local measures as would subdue inflammation and prevent closure of the pupil. Of the cases 17 were associated with gout, diabetes, herpes of the fifth nerve, influenza, and pneumonia. Ten patients had some septic focus on the skin or on a mucous membrane or cavity. In 6 cases there was disease of tonsils, and 23 patients had an affection of the alimentary tract, while 7 had a diseased condition of the genito-urinary system. One case followed a smart blow on the eye, and another patient had iritis as a sequel of sympathetic ophthalmia.

In no less than 74 of the 200 patients the sole cause found was pyorrhœa. When these cases were seen early and the offending stumps or teeth were removed the clearing up of the iritis was strikingly rapid. Of the remaining cases 22 had pyorrhœa in association with other diseased condition. In the cases in which pyorrhœa alone was found there were twice as many women as men. Of the total number 48 per cent. had their mouths affected, and it would be of great value if members of the dental profession could recommend a preventive of this appalling state of affairs, which seemed to lay the foundation for numberless diseases involving all parts of the anatomy, including the eye.

Sir ANDERSON CRITCHETT directed his remarks to the treatment of iritis. Forty years ago Sir John Tweedy made the suggestion that in many cases where atropine proved ineffective the sulphate of duboisine was a more powerful mydriatic, and in some cases he had found that where atropine was practically powerless he had been able to break down synechiæ with the more powerful drug. It was never necessary to use more than 2 grains to the ounce, the equivalent of 6 or 8 grains of atropine. It must not be allowed to pass down the duct into the throat. Leeches he still regarded as very useful in the early stages. Gonorrhœa was admittedly a frequent cause of iritis. He quoted the opinion of the late Mr. Nettleship as to the real good conferred by iridectomy in some cases of iritis, but the procedure was contra-indicated in keratitis punctata, chronic thickening of the iris with very extensive synechiæ, and the existence of myopia. Mr. Nettleship considered it a mistake to reserve that procedure until all other plans of treatment had been patiently tried. In his (Sir Anderson Critchett's) own experience few things had impressed him more than the extraordinary value of iridectomy both as a preventive and as a curative agent in the cases for which it was specially appropriate. But it must be a good iridectomy.

Mr. J. G. TURNER discussed the subject from the standpoint of the odontologist, and referred to the work he did with the late John Griffith in trying to trace the relationship between dental sepsis and eye diseases, based upon the observed connexion between gonorrhœa and iritis. Probably the causal agent was an infection by means of the blood stream or lymph stream, either toxic or, more probably, actually microbial, and seldom by direct continuity of tissue. Only seldom was a mouth seen which was free from the possibility of infection, and even when the last tooth had gone and a plate was substituted the danger had not gone, for an artefact factor was introduced in the production of dental sepsis. When the periodontal sulcus was infected it was a practically undrainable area. When sticky food was eaten the area referred to close to the neck of the tooth was not cleansed, and a nidus was thus formed for the multiplication of germs. A second source of sepsis was by caries and a septic tooth. A dead tooth always was septic so long as it remained in the mouth. A German investigated a large number of dead roots, and he did not find one which was aseptic. There was nothing which would penetrate and follow up the minute canals of the dead root. "An eye for an eye and a tooth for a tooth" might stand, but a tooth for an eye was a bad bargain. Tooth-cleaning, to be really effective, should be taught by an expert. Most of the ordinary cleaning was futile, because it did not reach the gum edge; the lingual surfaces of the teeth were practically untouched. Much might be done in the way of prevention by avoiding sticky foods. He had looked through the skulls of various races and various ages of mankind, as well as skulls of animals, and they followed the one rule: Where the food was sticky, starchy, and sugary, decay and pyorrhœa were found; where the food was only meat, neither decay nor pyorrhœa existed.

Dr. H. LYON SMITH said he had been working at the causation of arthritic conditions for eight years, and the evidences which he had obtained that bacteria, or their toxins, were the chief causes of arthritic trouble were derived by studying vitiated conditions of blood, most of which he believed were brought about by bacteria. The toxins and the bacteria prepared the ground; it was the element of strain or injury which determined the site. Therefore he had considered it sound practice to recommend every arthritic person to have his refraction carefully tested by an expert, for he believed many cases of iritis might be prevented if eye-strain were avoided. It was long supposed that tubercle bacilli, gonococci, and the syphilitic virus were the only organisms capable of setting up iritis; but the bacteria of pyorrhœa and those concerned in nasal catarrh, bronchitis, colitis, urethritis, salpingitis, &c., were all equally capable of producing it. In August, 1915, he published a paper describing a test by direct hæmolysis as a method of detecting bacterial toxins in the blood, and he was not aware that the statements he then made had been contradicted. He examined the blood of 450 people, most of them suffering from chronic rheumatism or gout. In 8 iritis was a secondary trouble. In 4 of the cases the influenza bacillus or its toxin was answerable, in 3 the tubercle bacillus, and gonorrhœa in only 2 cases. The toxins of streptococci and staphylococci were present in all the 8 cases, and in 3 *B. pyocyaneus*, which latter was a very depressing organism and was a common inhabitant of the alimentary tract. The bacillus of influenza elaborated a great variety of toxins, many of which were specially prone to attack nerve tissue. He believed iritis was a not infrequent sequel of a severe attack of influenza. In treatment strong bodily reactions by means of injections must be avoided when the eye was involved. For example, when using tuberculin a commencement should be made with something less than 1/250,000th of a mgm. He had heard such a dose spoken of scornfully as too small to give an effect either way, but experiments with colloid mixtures showed definite effects from even billionth dilutions.

Captain A. W. ORMOND, R.A.M.C., thought Mr. Turner's contentions proved rather too much, for on his thesis iritis should be much more common than was the case, especially in out-patient ophthalmic practice, where the general run of mouths was deplorable. Did rheumatic fever produce iritis at all? He also asked for a scientific definition of gout. He did not think it possible that errors of refraction and eye-strain could cause iritis. An important point was as to the duration in an active stage of the gonococcus in the tissues; it had been said that it remained in the crypts of the prostate for 15 or more years, but that did not coincide with other statements. He found leeches very useful for iritis, but they were difficult to obtain. He found great comfort was obtained by the continuous application of the electric coil.

Mr. ERNEST CLARKE believed that a point of strain or traumatism was the point for the manifestation of gout when it was in the system. If the metatarsal joint was defective gout manifested itself there; if eye-strain were present, iritis would probably occur. He always tried correction of the latter before recommending iridectomy.

Dr. C. E. LAKIN said he could not remember an instance of a toxic case being associated with a local outpouring of inflammatory fluid. He strongly supported the view that in iritis a microbial infection was at work, due to an embolic process. He believed the reason the iris was affected was that at the junction of the iris and the ciliary body there was a change in vascularity from a highly vascular to (comparatively) an avascular arrangement, the latter containing less hæmoglobin and less oxygen, and hence organisms were able to flourish there.

Mr. LESLIE PATON related a case in which he was able to derive proof that the eye condition was directly due to the foul condition of a tooth stump. The case started as one of deep keratitis profunda, and iritis developed later.

The PRESIDENT replied on the various points raised.

DONATION TO DUNDEE ROYAL INFIRMARY.—At the annual meeting of the Dundee Royal Infirmary held on June 11th the chairman stated that the total expenditure for the year was £27,362, and the deficiency on the year's working was £10,089. This deficiency has been wiped off by Mrs. Marryat, of Belmont, sister of the late Sir James K. Caird, Bart., and the directors expressed their sincerest thanks to that lady for her great kindness. A further donation of £210, and legacies amounting to £250 were also intimated.

THE LATE DR. WINSLOW ANDERSON.—The death occurred in May in New York of Dr. Winslow Anderson, at the age of 57, who was for many years the editor of the *Pacific Medical Journal*. Dr. Anderson, who graduated at the University of San Francisco in 1884, later took the English double qualification, and proceeded to the Membership of the Royal College of Physicians of London. He was originally interested especially in pharmaceutical chemistry and materia medica, but later became professor of abdominal surgery and gynæcology in the College of Physicians and Surgeons of San Francisco, over which institution he was presiding at the time of his death.

Reviews and Notices of Books.

On Causation, with a Chapter on Belief. By CHARLES A. MERCIER, M.D., F.R.C.P., F.R.C.S. London: Longmans, Green, and Co. 1916. Pp. 228. Price 4s. net.

Dr. Mercier has a happy gift of infusing a strong vitality into every subject on which he writes; he possesses, moreover, many of the qualities of the first-class critic—namely, an incisive and entertaining literary style, a habit of going straight to the main points, and a mortal animosity towards all forms of pedantry and humbug. In his latest work all these characteristics are displayed to their fullest extent. Dr. Mercier has—one would almost think intentionally—looked round for the dullest and driest science he could find; he has pitched on logic, and seems to take a malicious satisfaction in re-animating that venerable study and in directing his shafts of criticism against its orthodox exponents. To admire Dr. Mercier's virility of method is, however, a different thing from endorsing all his conclusions. We venture to think that the main value of the book lies in the clean drive through the pedantry with which logic has been surrounded; the inherent heterodoxy or even iconoclasm; the freshness of its point of view. Dr. Mercier ignores or ridicules most of the work of his predecessors: his doctrines should cause the disciples of Aristotle to groan in their tombs. It often happens, however, that those who entirely cut the painter as regards the past, while gaining much in originality and vigour, lose somewhat in solidity of foundation. Dr. Mercier has not altogether escaped this danger. He begins by examining the theories of causation advanced by Hume, Mill, Welton, Professor Karl Pearson, Mr. Bertrand Russell, and Dr. McTaggart. After stating in turn the views of each, he proceeds to demolish them all with satirical impartiality. As regards such of these authors as are still living his criticisms are often cogent and sometimes appear unanswerable. But we do not think he fully appreciates the strength of the positions occupied by Hume and Mill, nor, indeed, by Mr Russell, with whose works Dr. Mercier does not seem to be so well acquainted as he is with those of his other victims. Dr. Mercier condemns all theories of causation which reduce it to the elementary factors of antecedence and consequence. There is something more, he thinks, in the relation of cause and effect than mere invariability of association or succession. He drags in the conception of "Power" in the cause, which compels the effect to follow. A cause, he holds, is something more than appears on the surface; it contains an active principle—though Dr. Mercier does not use the word—which renders the effect inevitable. In this conviction we may see an analogy with Dr. Mercier's views on vitalism. While in physiology he is prepared to believe that there is some "vital" agency which enters into the working of the organism and removes it from the sway of material and physical laws, so in logic he roundly affirms something of a metaphysical nature in the cause by which the effect is produced. The subject is thus linked up with wider philosophical tendencies, and agreement or disagreement with Dr. Mercier is likely to depend on the general school of thought to which the reader belongs.

After full discussion of the theory of the subject, Dr. Mercier comes to the practice. He illustrates the need for a clear and correct concept of cause by reference to the official publications on the causes of death and insanity. He has no difficulty in showing the extreme vagueness of these statistics, consequent upon inadequate definition of what is meant by cause. "The old legal maxim says that fraud lurks in generalities," and, as Dr. Mercier well adds, "to the uncritical it often seems that safety lies in generalities." He devotes an acute chapter to "Methods of Ascertaining Causes," and insists with truth that, if the rules there laid down were followed, the identification of many causes of insanity would be facilitated. Among the most interesting chapters in the book to the average reader are that dealing with "Errors in Attributing Causation," and the final chapter on "Belief." Throughout the work Dr. Mercier lightens and strengthens his arguments by a remarkable power of illustration and analogy. Though it cannot be anticipated that the book will give any satisfaction to orthodox logicians, yet it is one that they can scarcely pass by without some definite reply. At any rate, such silence would be fairly construed as a confession of weakness.

Notes on Military Orthopædics. By ROBERT JONES, C.B., F.R.C.S. Edin., &c., Colonel, A.M.S. London: Cassell and Co. 1917. Pp. 132. Price 2s. 6d. net.

As Sir Alfred Keogh remarks in his introductory note, the publication of this book is most opportune, and the long experience and reputation of the author its best recommendation. The volume, tersely but lucidly written, will be cordially received by military surgeons, who will find in it the practical application of orthopædic principles to the treatment of war injuries. In a few sections, each concerned with one of the main problems of military orthopædic surgery, a large amount of helpful instruction is imparted. The chapters dealing with the disabilities of the knee-joint and with bone-grafting are specially useful. Himself the champion of the manipulative school in the treatment of fractures, Sir Robert Jones emphasises the utility of efficient mechanical measures; when open operation is rendered absolutely necessary by the occurrence of faulty or deficient union he employs bone-grafting in lieu of plates and screws. He holds, by the way, that the latter methods require less surgical skill than does the carrying out of the technique of bone-grafts.

The omission of a special chapter dealing with the treatment of stiff joints by manipulation, or so-called bone-setting, is, perhaps, unfortunate, seeing how extensively these methods are at present being applied by orthopædic surgeons in military hospitals.

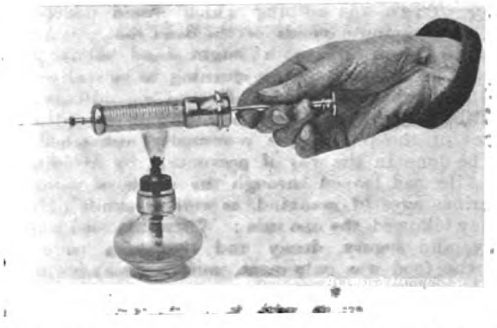
Traitement et Restauration des Lésions des Nerfs. By Mdme. ATHANASSIO-BENISTY. Paris: Masson et Cie. 1917. Pp. 179. Price 4 francs.

ISSUED as a sequel to the same author's "Formes Cliniques des Lésions des Nerfs," lately reviewed in this journal, this volume, with a preface by Professor Pierre Marie, is devoted to a full exposition of the methods of treatment of injured nerves and of the consequent paralyses, by surgical and mechanical means. A chapter is also given to the symptoms indicating serious injury to the nerves. Taken together the two volumes give an excellent account of the new knowledge of nerve injuries acquired during the present war.

New Inventions.

THE LUC QUARTZ GLASS SYRINGE.

WE have received from Messrs. Allen and Hanburys, Limited, Wigmore-street, W. 1, a glass syringe which possesses the practical merit of withstanding sudden and extreme change of temperature occasioned by any form of sterilisation. The instrument, of which we give an illustration, is called the *Luc* and is made of fused quartz glass, being so constructed that it is unnecessary to separate the parts before sterilisation. The complete syringe may be



placed in boiling water without fear of breakage, distilled water may be drawn up into it and boiled over a flame, or hot oil at a high temperature drawn up. The only precaution required is to withdraw the piston from the barrel into the metal container attached to it in order to prevent the glass barrel, which does not expand when heated, being broken by the expansion of the metal piston within it. The apparatus, its metal case, and a needle-holder can also be sterilised as a whole by dry heat, thus preventing any risk of rusting either the case or the needles. The price of the syringe varies, according to the size and accessories, from £1 10s. to £3.

THE LANCET.

LONDON: SATURDAY, JUNE 23, 1917.

The Treatment of Septic Wounds.

SIR ALMROTH WRIGHT possesses uncanny skill in investigating physiological processes, in devising ingenious experiments to discover the defensive powers of the body, and in initiating, on the conclusions which are drawn from these experiments, therapeutic measures new in direction and valuable in result. He has not contented himself with the work he has already done, and been busy merely with elaborating or perfecting it, as might be hastily assumed from his recapitulations; his labour has been progressive, the common direction of his energies being the obtaining of a perfect method of treatment of infected wounds. In the present number of THE LANCET he has set forth the conclusions at which he has arrived to-day; the basis of his address was delivered some weeks ago at the Royal Institution, since when he has had opportunities of adding to his message in numerous particulars.

The address is a piece of straightforward arguing, which deserves close reading. To appreciate fully the basis of fact on which Sir ALMROTH WRIGHT has founded his methods, we must recognise that the natural defensive power of the body against microbic invasion is twofold: it depends partly on the phagocytic action of the leucocytes and partly on the destructive action of the effused serum. The power possessed by the serum is of vast importance, and is closely associated with the power of normal blood serum to neutralise the digestive ferments and especially trypsin; and certain experiments, which are reported, indicate that it is this antitryptic action which enables the serum to inhibit the growth of septic micro-organisms. The phagocytic action of the leucocytes is a process whose significance has now passed into common pathological knowledge. But before the leucocytes can engage invading microbes they must have migrated from the capillaries. This preliminary action of resistance can be stimulated, for certain substances applied to the surface of a wound have the power of increasing this emigration, just as other substances can reduce the diapedesis to a minimum. For instance, a weak salt solution favours the migration of leucocytes, but a 5 per cent. solution of salt will reduce it greatly, while in the presence of gross sepsis the resisting movement is brought almost to a standstill. Another feature in this elaborate physiological process is brought to attention by Sir ALMROTH WRIGHT. Septic wounds can be divided into what he terms "live spaces" and "dead spaces." In a live space the tissues are well supplied with blood; there is an abundant flow of antibacterial lymph and the terrain is suitable for phagocytic action. In a dead space the tissues have been bruised and cut off from their blood-supply, so that the serum and the leucocytes can only act in their different ways at a serious disadvantage. The infection quickly spreads into neighbouring tissues, toxins are absorbed, and the patient has septic fever. An abscess cavity is, of course, the typical dead space. The application of knowledge of this kind, gained by laboratory experiment, to the treatment of septic wounds follows clearly enough, whether we are dealing with old-established principles or a new technique. The first point in the treatment of an infected dead space must be drainage, and every portion of a wound which would, if left to itself, become a dead space must be laid open. Then comes the treatment of the infected walls, and with regard to the extent of infection we have to remember, and remember always, the conditions of war. Often it must happen that hours or days elapse before the wound comes under the surgeon's hand. An infected wound if left to itself grows dry, in which case the capillary circulation will cease and there will be no outflow of bactericidal lymph, while there will be an enormous increase in the growth of septic organisms; thus sloughs are formed and the sepsis tends to spread. This drying process will go on during the transport of the wounded if no salutary interference is forthcoming. But should the wound be simply kept moist there will follow a great increase in the number of microbes, the leucocytes poured out will die, and the tryptic ferment set free will exert an erosive action on the walls. Again the infection tends to spread. What shall be done, then, to wounds during transport when they cannot be dressed? Sir ALMROTH WRIGHT answers this question with an illuminating account of the investigation into the action of antiseptics in living tissues. He shows that the influence of an antiseptic applied to the interior of a wound is bound, in ordinary circumstances, to be superficial, and that frequent re-application of an antiseptic during transport will fail of the desired effect; whereas the employment of a suitable hypertonic solution will favour the outflow of lymph and so drive back the invading microbes. The routine of treatment at the hospital, which all these researches lead up to, is no new thing. The wound has to be made clean, and this can be accomplished by thorough drainage and the use of hypertonic salt solution, which both assists to remove dead tissues by a process of cleansing digestion, and at the same time causes an increased flow of lymph to combat the infection itself.

Sir ALMROTH WRIGHT'S address closes with an instructive discussion of the use of Dakin's solution and of the Carrel method. So far as Dakin's solution is concerned, the conclusion is reached that it has little antiseptic power, which is quickly lost by evaporation, and then its action is physiological, and the outpouring of lymph and leucocytes goes on. With regard to the Carrel method, Sir ALMROTH WRIGHT argues that it cannot act by completely sterilising the wound; but he regards the procedure as of extreme value, for it furnishes

a new and improved technique for physiological treatment of an infected wound, while he considers that its success depends very little on the antiseptic action of Dakin's fluid. The author has spared neither pains nor time in the investigation of a very difficult and important subject, and the address must be read closely, if the basis of the arguments is to be fully realised.

Depopulation and the Endowment of Motherhood.

THE smallness of the birth-rate in France is a familiar topic to which the war has added a new and poignant interest. In the *Revue d'Hygiène* for April–May, 1917, appears the report of a small commission on depopulation in France, regarded from a physiologico-medical point of view, presented by Professor CHARLES RICHET to the Academy of Medicine. The facts are well known, but bear repetition in the striking form in which Professor RICHET presents them. The annual number of births, which in 1876 slightly exceeded 1,000,000, had fallen in 1913 to a little over 745,000, and the proportion per 10,000 of population from 210 in 1910 to 172 in 1911. As is usual with a low birth-rate, infant mortality also stands at a low figure, but, as Professor RICHET points out, no decrease in the infant mortality rate can compensate for such a fall in the birth-rate. While at the end of the first year of life in Russia, for example, taking the birth-rate at 465 per 10,000 inhabitants, against one of 200 in France, the 465 babies might have been reduced to 372, a larger proportion of the 200 French babies would survive, and yet the total number not exceed 180. The low birth-rate is present in all sections of the community, urban and rural, rich and poor, worker and intellectual alike. The drop is, in fact, common to all European nations, but greater in France than elsewhere. Taking the birth-rate in each country for the decade 1841–50 as the standard and calling it 100, the rate in the decade 1901–11 was only 74 in France, compared with 84 in England and Sweden, 89 in Austria-Hungary, and 92 in Germany. For every additional Frenchman per year there were 70 Russians and 200 Europeans. In France it would take 370 years to double the population, whilst in Germany a century would see the number of inhabitants trebled.

Whilst many causes such as the emigration into towns, alcoholism, the effect of the civil code and of increasing irreligion have been called in to account for some share at least in the diminution, the prime cause is undoubtedly, Professor RICHET assured his hearers, the sterility or, more correctly, the non-fecundity of marriages, 15 per cent. of which are absolutely sterile, the remaining 85 per cent. of parents limiting the number of their offspring to an agreed figure. Certain districts of Paris of a higher social class have a still smaller birth-rate than more populous parts of the city, but there is no doubt that all classes have adopted neo-Malthusianism as their family religion. In 1891 a family with seven children or more was a rarity in Paris (1·3 per cent. of the total number of families), and even in the country the proportion in the last Census year (1911) did not exceed 3 per cent. Professor RICHET'S Commission holds that argument is likely to be fruitless, inasmuch as the smallness of the family in France is a question of economy and foresight. A child up to the age of 15 years costs the family exchequer at least 400 francs per annum, representing one-sixth part of the average paternal earnings. Three children would account for half the income, and are therefore the extreme limit for the prudent wage-earner. The only practical remedy, states the Commission, is the endowment of motherhood by an allocation commencing from the moment that pregnancy becomes certain and lasting to the end of the first infancy, a period defined by the eruption of the twentieth tooth. The Commission holds, indeed, that families with no or few children should pay for those who have many, and regards 2000 francs a head as a very moderate price for the country to pay for a potential Frenchman.

We began by saying that the fact of the decreasing birth-rate was well known in France. It is also well known in this country. But opinion on this side of the Channel is widely divergent on the best way of dealing with the relative depopulation. Professor RICHET'S solution was evidently acceptable to a majority of his hearers at the Academy of Medicine, who are said to have warmly applauded his concluding remarks. In the discussion which followed it was left to a single speaker, M. BARRIÉ, to query where the revenue was to be found to provide for the endowment of motherhood. But the idea of a State subsidy for large families and of State assistance for the young children of widows is no new one in France, and is leading on there, as it has done in America, to the provision of child pensions as a matter of ordinary State policy. Judge HENRY NEIL, of Chicago, who is now in this country on a mission to popularise what is practically an endowment of motherhood, states that pensions to widows with young families to bring up are already given in 27 out of the 48 States, one State at least granting them—as Professor RICHET also proposes to do—to mothers irrespective of their civil state. In the States where the provision is in force the maintenance is granted in respect of all children under 14 years of age, ranging from 7½ to 10 dollars a month for each child. An advocate of the scheme points out that whereas it costs a hundred dollars a year to support an orphan by the pensions system, it has cost the State an average of three hundred dollars a year to support a child in an institution. The war is familiarising the whole civilised world with the notion of endowing motherhood in one form or another, and more is likely to be heard of it.

THE NATIONAL BABY WEEK.—A "Richard Burbidge Fund" will be opened at Harrod's Stores on July 2nd, and during the National Baby Week it will welcome every offering, however small. The late Sir Richard Burbidge was the chairman of the Finance Committee of the movement and the fund is intended to memorialise his interest in the work.

Annotations.

"Ne quid nimis."

THE CROONIAN LECTURES.

IN the second Croonian lecture[1] at the Royal College of Physicians of London Colonel J. G. Adami dealt with the difficult subject of adaptation in bacteria, and the consequent evolution of disease. After indicating the absurdity of thinking that the infectious diseases now known to us have afflicted man from his first appearance on the planet, he pointed out that if bacteria have been present from the beginning of the world, this would not imply that the specific infections have been in existence for the same period, for zymotic phenomena must run parallel with geological, which teach differently. The reason why we cannot recognise the descriptions of epidemics given by classical authors is not necessarily that they were incapable of noting characteristic symptoms; more probably they described conditions no longer existing. It is known that in more recent times infections have come and gone. The tritest example is the sudor anglicus, or "sweating sickness," but many diseases have made their appearance in comparatively recent times—e.g., diphtheria, cholera, syphilis. Here Colonel Adami warned his audience that a second principle may have to be considered. Certain of these diseases may have been present for an indefinite period endemic in a particular locality, and then with the opening up of trade routes have spread rapidly. Admitting this, the conclusions reached by a study of the geographical distribution of animals and plants must also be admitted—i.e., where a species (such as the rabbit or sparrow) when introduced into another continent shows an immediate spread—the fact that it was not there before forms an indication that the spread had arisen at a period subsequent to the separation of one continent from another. Whichever side was taken in the syphilis controversy, said Colonel Adami, it had to be confessed that this disease was non-existent in early Egypt or in the Rome of the time of Galen.

The Croonian lecturer's picture of the evolution of an infection is very interesting:—

"If every infection is due to the diffusion through the body of the toxins of one or other particular species of micro-organism, it deserves note that pathogenic microbes do not form an order by themselves, but, on the contrary, are singularly diverse in their affiliations. With scarce an exception every genus of micro-organism has its representatives among the pathogenic microbes, or, conversely, every pathogenic microbe has closely related forms differing from it in little beyond the fact that the one is virulent, growing in or upon the tissues, the other non-virulent. Next, these closely allied species are found suggestively either growing in the cavities and on the mucous surfaces of the body, or in the water and foodstuffs taken up by the individual. This state of affairs in itself strongly indicates that at some period or other pathogenic microbes have originated from those saprophytic on the body surfaces or existing in the foodstuffs. This natural deduction has been opposed notably by the German school of bacteriologists, with the late Robert Koch at their head, who stood out for the fixity of bacterial species."

In studying bacteria two apparently opposite and contradictory facts are to be made out: on the one hand they are extraordinarily conservative, but on the other there are certain changes of environment which lead to certain and definite modifications in the properties of bacteria, the orders of variation being usually given as three—fluctuations, mutations, and impressed variations or modifications. Colonel Adami brought evidence forward to show that in the bacteria at least what are usually considered as mutations, or chance variations, are in truth impressed variations due to specific alterations in environment. Whereas under the ordinary conditions of experiment certain members only of a bacterial colony take on the property of fermenting a foreign or new foodstuff, this condition of experiment can be so altered that all the members of the colony with absolute precision can be made to acquire this new property. The experiment can be so arranged as to demonstrate that here is no question of chance variation, of the survival of those forms, and those forms alone, which have exhibited variation in a favourable direction—no question, that is, of survival of the fittest—but that there is, within certain limits, direct adaptation in the Spencerian sense, direct equilibration between the organism and its environment. Certain experiments recently conducted by Major F. B. Bowman, C.A.M.C., with the typhoid bacillus, proving this point, were given in detail, and similarly, as an example of variation by loss of factors, there is the classical experiment, ever quoted, of Pasteur and his lieutenants, Roux and Chamberland, in which by exposing any culture of the anthrax bacillus over a given period to a given temperature of growth with absolute precision the power of the spore production is lost, and now for years—and thousands of bacterial generations—grown under ordinary conditions spore production does not manifest itself. Now if this be true of other properties, it must be true regarding virulence, and we have methods by which we can exalt or depress the virulence and pathogenic properties of bacteria, while we can take harmless non-pathogenic bacteria and with absolute precision, and not by chance variations, convert these into highly pathogenic virulent forms. It is this direct adaptation, evidently, that explains the origin of the infections.

[1] A summary of the first Croonian lecture was published in THE LANCET of June 16th (p. 921).

INCIDENCE OF INFECTIOUS DISEASE IN 1916.

THE report of the Medical Officer of the Local Government Board on the incidence of notifiable infectious disease during the year 1916 has now been published and contains, as always, much information of vital interest as to public health. As in previous years, the rates of infectious sickness in each thousand of the several populations are given in the local tables for 1916. The returns indicate that a considerable proportion of the cases were imported from abroad, having been notified at the seaports, which are therefore especially exposed to danger. In England and Wales only 4 cases of typhus fever were reported last year, as compared with 45 in the year preceding. Scarlet fever was notified in 75,722 instances, or fewer by 51,364 than in 1915; diphtheria in 51,707 instances, or 1890 fewer than in the preceding year; enteric fever in 5564 cases, as compared with 6364 in 1915 (in 17 instances paratyphoid was specifically mentioned). 1996 cases of puerperal fever were notified, against 2057 in 1915; 18,520 cases of erysipelas, as compared with 23,382; 1306 cases of cerebro-spinal fever, against 2566

in 1915; 689 cases of acute poliomyelitis, against 517 in 1915. Small-pox was reported, sometimes erroneously, in 149 instances last year, 55 of them being notified from places connected with seaports. The cases reported in 1916 were more by 59 than those reported in 1915. It will be noted that, with the exception of the two last, all the principal infectious diseases are reported to have been less prevalent in 1916 than in the year immediately preceding. Since 1911 the incidence of pulmonary tuberculosis has been notifiable throughout the country. In terms of population the disease was apparently observed during 1916 in the case of 2·10 per 1000 living, or somewhat more than in the preceding year. The reported cases, however, include a considerable number of duplicate notifications—a fact which must be taken into account in interpreting these rates. The rate was equal to 3·19 per 1000 of the population in London, and to 1·96 per 1000 in extra-metropolitan England.

THE FACTORS OF CARDIAC IRRITABILITY.

Dr. J. Strickland Goodall's Chadwick lecture on the Soldier's Heart, being based on the critical analysis of 2250 cases, and not on mere *obiter dicta*, is worthy of careful consideration. He starts from the postulate that since the heart is composed of both nervous and muscular elements it may become over-excitable as regards either component. Nervous irritability is usually characterised by increased rate, while the rhythm may or may not be affected. He classifies the nervous irritable heart into three groups. The first is the emotional, susceptible, or unstable heart. It is essentially physiological, but reacts violently and excessively to every emotion, such reaction being aggravated by overwork, alcohol, tobacco, and anything which impairs nerve control or injures the general health. The second is the youthful or fretful heart, which "speeds up" during inspiration and slows down during expiration. It is entirely physiological, and should not be regarded as a bar to active service. The third type is where there is tachycardia, either permanently, as in Graves's disease, or periodically, as in paroxysmal tachycardia. He believes that in persistent tachycardia fright or other emotion causes the suprarenal to pour adrenalin into the circulation, and the thyroid exerts itself to neutralise this. The over-action of the suprarenal is temporary, but the thyroid continues to over-act. He regards the first and third of these types as only fit for sedentary or light military duties. Irritability of the heart muscle is indicated by a definite but variable irregularity of the pulse. He believes that the irritable heart of the soldier falls into this category, and that it is begotten by overwork and under-rest. X ray examination shows that hearts which exhibit a persistent over-excitability either of muscle or nerve are too horizontal in position because they are too soft, so that they lie more or less on the diaphragm and may be deformed by distension of the stomach. This horizontal type is found in old age, in sedentary workers who take too little exercise and are often the victims of a chronic toxæmia, after infective conditions, and after long-continued overwork or mental strain with insufficient rest. The tone of any organ depends primarily on two factors, the integrity of the nervous control of the organ and systematic use followed by adequate rest. Lack of tone arises from impaired nervous control, habitual overwork with insufficient rest, or disuse, insufficient use, or misuse. An exhausted tissue or organ is also over-excitable, and hence we find that with atonia there is over-excitability. The whole heart may suffer in this way, or the change may be confined to the auricles or to either ventricle. The right ventricle is affected mainly by overstrain, the left by arterio-sclerosis. Auricular over-excitability is much commoner in soldiers than in civilians, and Dr. Goodall is of opinion that it is a more serious condition than ventricular over-excitability, as it usually passes into some graver condition, such as auricular flutter or fibrillation.

PUBLIC HEALTH WORK FOR WOMEN.

PUBLIC health work affords to-day good openings to well-educated women who have qualified by training. Women can thus equip themselves to become sanitary inspectors, health visitors, superintendents of schools for mothers and similar institutions, relieving officers, lady almoners, lecturers and teachers giving instruction in matters connected with sanitation and health, secretaries to local health societies, and officers in connexion with the carrying out of the National Insurance Acts and the Poor-law. Vacancies in such positions are increasing in number and variety, and although they may not offer all the opportunities that the medical profession holds out to clever and ambitious women, yet they have the compensating advantage of not necessitating a long, exacting, and costly education. A course of instruction is offered by the National Health Society under which a training of from four to six months is given, with a view to fitting students for the posts enumerated, the period of subsequent training necessarily varying in accordance with the intentions of the student. The National Society, in fact, offers itself as an organisation prepared to help its associates, and women generally, by advice in the selection of a particular career, and to provide, so far as it can, teaching, encouragement, and assistance in the obtaining of posts. Miss Fay Ray Lankester, the secretary of the National Health Society, 53, Berners-street, London, W. 1, invites communication with her from women who are desirous of helping their country and themselves by undertaking useful work.

NEURASTHENIA IN SOLDIERS.

LECTURING at the Royal Institute of Public Health on June 13th, Sir John Collie stated the predisposing causes of neurasthenia in soldiers to be the fear of being afraid, want of sleep, and the terrifying experiences. The emotional suppression cultivated by every good soldier added its quota to the state of anxiety predisposing to war-strain. He distinguished three types of neurasthenia: the first stage of mere asthenia or weakness; the more advanced cases with well-marked tremor, extreme nervousness, and loss of weight; and a hypochondriacal class whose self-control had always been subnormal, and unfitted by temperament to be soldiers. In the treatment of the neurasthenic the whole environment should be one of cheerfulness and hope, combined with confident reassurance of complete recovery. Many of these cases, Sir John Collie said, were now treated immediately behind the firing line, where the early application of psycho-therapeutic methods had been signally successful in cutting short attacks. Each

army now had its special shock hospital staffed by selected medical officers. A Special Medical Board for Nervous Disorders, of which he was president, dealt with men discharged for neurasthenia, re-examining them after leaving the service from time to time. This board was in close touch with the local War Pensions Committees throughout the country, and assisted men to obtain work in civil life. Several large proprietors had agreed to employ men recovering from the effects of shell shock on the land, and arrangements were being made to form camps in country districts where the men would be housed during the summer months. The first Home of Recovery had been provided at Golders Green by the British Red Cross Society and the Ministry of Pensions. The Ministry of Pensions had arranged for intensive French culture to be a feature of the outdoor training of the men, a pursuit which, with its comparatively light work, should be specially suitable for large numbers of men suffering from functional nerve disease.

INDUSTRIAL ACCIDENT MORTALITY IN AMERICA.

THE increased insecurity of life during the European War made itself felt in America during 1916 and is seen in the mortality statistics compiled by the Metropolitan Life Insurance Company for their 9,000,000 white policy-holders. The accident rate for the working classes of the United States in 1916 was found to have increased five points per 100,000 living over the rate for 1915, in contrast with the tendency in recent years toward a reduction in the fatal accident rate. The total rate of 73·5 (68·9) included traumatism by fall, 13·7 (12·4); accidental drowning, 9·5 (11·9); traumatism by automobiles, 8·8 (5·7); burns, 8·4 (8·1); traumatism by steam railroads, 7·6 (7·3); and other less frequent causes. The figures in brackets are the corresponding rate for 1915. Accidental drowning alone shows a decrease, chiefly due to the inclusion in 1915 of the deaths in the Eastland disaster. Mortality from automobile accidents and injuries showed by far the largest increase, being responsible indeed for three-fifths of the increase in the total accident rate in 1916. The company attributes the general rise to increased activity in industry and the speeding-up incident to war conditions. It is instructive to see this result proved by figures for a non-combatant country. Probably in every country of the world 1916 was a less safe year to live in.

THE WORK OF ASYLUMS IN EGYPT.

THE official report for the year 1916 of the Lunacy Division of the Ministry of the Interior, Egypt, gives welcome evidence of the steady advance which is being made in lunacy administration in Egypt. Much of the non-medical work has now been taken over by the General Board of Administration, relieving the heads of asylums of an enormous burden and setting them free for their special work. Again this year, as is usually the case, there is an excess of applicants over available accommodation. The two asylums together provide room for 1550 patients, and of the 1516 lunatics notified 970 were admitted, while 575 patients were sent back to their friends uncured but supposed to be harmless. Besides these, 324 British soldiers were treated by Dr. J. Warnock in a small special hospital. Although in itself one man's work, the Criminal Lunacy Department has also fallen to Dr. Warnock, who has tabulated the forms of insanity associated with various forms of crime as well as the special causes contributing to the criminal lunacy. Among the latter pellagra plays a very important part in Egypt; haschish is also a common cause. Careful examination of the Wassermann reaction revealed the frequent presence of syphilis, not alone in cases of general paralysis, but in many other forms of mental disorder. A number of patients were received as voluntary boarders, a gratifying recognition of the nature of mental disorder among native Egyptians. The death-rate was 11·2 per cent. of the average asylum population. Pathological study was carried on in the asylums notwithstanding the war, and dealt chiefly with ankylostoma, malaria, and bilharzia. The associated asylum of Khanka, under the direction of Dr. H. W. Dudgeon, employs many patients on the land, who provide vegetables for both institutions. The report gives evidence of the untiring service of the responsible authorities, of which the award to Dr. Warnock of a New Year honour was a timely recognition.

A STANDARD OF CLEANLINESS.

IN a pamphlet dealing with uncleanliness among elementary school children, reprinted from *School Hygiene* for February last, Dr. A. H. Hogarth, medical officer of health for Buckinghamshire, laments the inability of many school medical officers to understand the elementary principles underlying statistical calculations, and states that no accurate representation apparently exists of the extent of uncleanliness among school children. He mentions the common grounds of statistical fallacy, enunciating four requirements which must be satisfied in examining children for the purpose in view, viz., non-selection, non-preparation, accuracy of examination, and the statement of a standard of cleanliness. For his own county he has adopted a classification into seven groups, each capable of precise definition, starting from (1) clean, through (2) nearly clean—that is, hair not containing more than 10 or 12 nits, or a head, face, and neck in need of washing—and (3), (4) nits only, counted by tens or by hundreds, to (5) few nits plus one or more lice, (6) many nits plus lice, and (7) a dirty and neglected child whose home is to be visited by the N.S.P.C.C. He gives percentage tables of inspections during the years 1912–15, in which at a first inspection the number of clean children progressively increased from year to year, the figures in boys being 75, 85, 94, 96, and in girls 40, 58, 75, 81. Surprise visits are paid by the medical officer to the worst schools reported by the nurses with a view to searching out the persistent offenders and taking them to the police courts. This policy has made itself felt in every parish of Buckinghamshire, there being no subsidiary court which has not tried a batch of such cases, and no local newspaper which has not faithfully reported them. Between January, 1912, and December, 1915, 313 parents were summoned on account of 352 children, and 284 parents were fined from 1*s.* to 10*s.* each. The committee's practice of keeping an exact record of the numbers of nits or lice found at each examination by the nurse has proved most useful in obtaining convictions in court. Statistical accuracy has been more than its own reward.

THE office of the Ministry of Pensions has been removed from Great George-street to Westminster House, Millbank, S.W. 1.

Correspondence.

"Audi alteram partem."

WAR EMERGENCY FUND OF THE ROYAL MEDICAL BENEVOLENT FUND.

To the Editor of THE LANCET.

SIR,—We beg to support the urgent letter of appeal to this Fund which appeared in last week's medical journals. This Fund was instituted by the Royal Medical Benevolent Fund last year to afford assistance to members of the profession who, in consequence of having joined the Army Medical Service, find themselves in temporary difficulties.

We very strongly commend the claims of this Fund to the generous support of both the profession and the public.

We are, Sir, yours faithfully,

FREDERICK TAYLOR, President, Royal College of Physicians.
W. WATSON CHEYNE, President, Royal College of Surgeons.
W. H. NORMAN, Surgeon-General, R.N.,
Director-General of the Medical Department of the Navy.
ALFRED H. KEOGH, Director General, Army Medical Service.
WILLIAM OSLER,
Regius Professor of Medicine, University of Oxford.
THOMAS CLIFFORD ALLBUTT,
Regius Professor of Physic, University of Cambridge.
JOHN TWEEDY,
Late President, Royal Medical Benevolent Fund.

11, Chandos-street, Cavendish-square, W. 1, June 16th, 1917.

*** We publish elsewhere the details of certain cases which have already been relieved by the War Emergency Fund.—ED. L.

EDUCATION OF THE LEFT HAND OF DISABLED SAILORS AND SOLDIERS.

To the Editor of THE LANCET.

SIR,—Under the above heading Dr. C. W. Hutt records, in THE LANCET of April 7th (p. 553), the method used by M. Tamenne for teaching writing with the left hand to men who have lost their right hand. The results achieved are undoubtedly satisfactory, but it will be found that it is infinitely easier to write in exactly the opposite manner, and the reasons will be appreciated when explained.

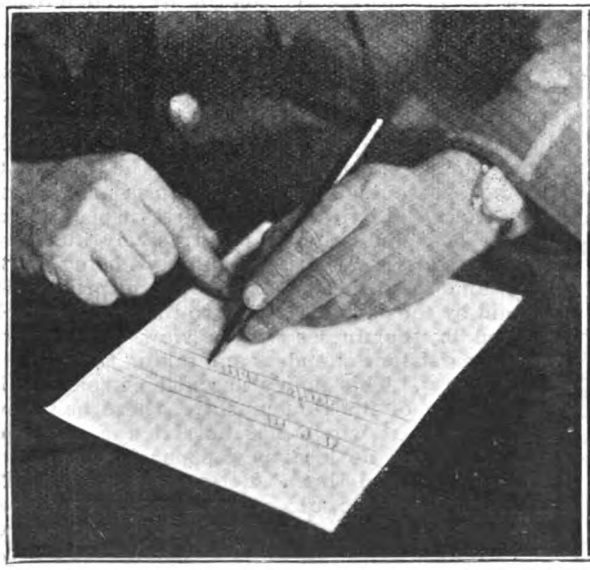
Firstly, instead of the line of the writing sloping up towards the right shoulder as shown in the article of April 7th, the line should be at an angle of about 50° with the edge of the desk towards the right ↘. At the same time the slope of the writing should be backwards at about 45° to the writing line, at least to commence with. In this method it will be found that the fingers are in the most natural position for writing, the arm and wrist being in a straight line, and there being a wide sweeping movement of the wrist if required. It will be found, and can be seen every day with those trying to teach themselves to write with the left hand, that to write straight across the paper—i.e., parallel to the edge of the table—leads to a most cramped position and to great limitation in the movement of the wrist, and that a great deal of the movement across the sheet has to be made with the upper arm.

This difficulty M. Tamenne has experienced, and following his rule (5) "always take care that the hand is immediately below the point where he is writing," he states, "the man will find this difficult to carry out and the effort to do so will tire his hand." Precisely so, because the position is cramped and unnatural. My method I have demonstrated to the men coming before a Medical Board here, and they unanimously declare that it is much easier than the "straight across" method which they try for themselves. If anyone will try the two methods for himself for a short time he will see the difference. I endorse emphatically the importance of not attempting to get on too fast. Also it makes an enormous difference if the teacher can write left-handed. The importance of this I found some years ago, when I was responsible for a boy of 13 who had a right-sided birth palsy. Several schools had vainly tried to teach him to write with his left hand and the result was lamentable. I found that the reason was that his damaged brain could not translate to his left hand the motions shown him by his tutor's right hand. The only remedy was to learn to write with one's left hand, so that he could copy the movements. This I did with an entirely satisfactory result, as he easily copied the movements he saw. The idea of slanting the writing I got from watching a left-handed clerk many years ago.

There is one thing that is important, not to start the men with a broad pen, or they are apt to make blots owing to the reverse way the pen is held as compared with the writing. A fine fountain pen I find the easiest to use.

The reverse print (photograph B) shows how exactly similar the position I describe is to the correct right hand method. Later on, as in ordinary writing, the slope can become more upright; but I am convinced that it is easier to commence in the manner shown.

A



B



The photograph A shows the position of the hand and paper when writing with the left hand. Photograph B is a reverse print from the same negative, showing similarity of position to correct right hand method.

I am, Sir, yours faithfully,

ELWIN H. NASH, Major R.A.M.C.

The Lord Derby War Hospital, Warrington.

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—I was much interested in Professor A. R. Cushny's paper on Digitalis in Auricular Fibrillation in your issue of June 9th, especially in view of the recent correspondence in your columns on the Lumleian lectures. Up to the present it has been assumed that the beneficial action of digitalis in auricular fibrillation is due to the blocking of impulses from auricle to ventricle through stimulation of the inhibitory mechanism of the vagus. But Professor Cushny states in his paper—

> That in a number of observations which I made in Mackenzie's wards with Marris and Silberberg we satisfied ourselves that in auricular fibrillation the change in conduction is not inhibitory in nature, for it is not prevented by complete paralysis of the vagus by atropine.

Later on he says—

> We have two types of digitalis action on the heart. ..... The second or anomalous reaction occurs in the auricular fibrillation in man and not in that experimentally induced in animals; here the *heart is slowed by direct action on the muscle* independently of the normal inhibitory mechanism.

In his final paragraph Professor Cushny says—

> Another result of digitalis on the animal heart *is the increase in the strength of contraction.* Does this play no part in the improved efficiency of the heart?

Since the advent of electro-cardiography it seems to me that the neurogenic doctrine has been exalted to a position of undue importance, more especially in relation to so-called auricular fibrillation. The irregularity of rhythm in the ventricle in auricular fibrillation is attributed, as far as I am aware without any sufficient evidence, to the irregular transmission of feeble, incoördinate stimuli from the flickering fibres of the fibrillating auricle, which one would not suppose capable of exciting a contraction in the ventricle. But even admitting this, how can the mere cutting off of a few nervous impulses from auricle to ventricle by itself restore the functional efficiency of a heart muscle that has broken down under stress? Yet that has been the explanation given of the action of digitalis in these cases. It is a great satisfaction, therefore, to find that so distinguished an authority as Professor Cushny has now raised the question as to whether it is not after all increase in the strength of the contraction of the cardiac muscle induced by digitalis, which plays an important part in improving the efficiency of the heart. It is not merely in auricular fibrillation that digitalis is of value. Any clinician knows the extraordinarily satisfactory results obtained from the administration of digitalis in cases of heart failure and dropsy associated with mitral incompetence, even when the pulse is quite regular and there is no question of "auricular fibrillation." Surely the beneficial effect in these cases is due to the action of digitalis in improving the tonicity of the cardiac muscle, so that the dilatation is reduced, the force of the beat improved, and the quantity of residual blood diminished.

In mitral stenosis, whatever may be the case in the valvular lesions, the heart is working at a great mechanical disadvantage. The left ventricle is small, imperfectly supplied with blood, and has comparatively little work to do. The right ventricle hypertrophies on account of the extra work imposed by the steady increase of pressure in the pulmonary circulation due to the narrow nozzle at the distal end in the form of the stenosed mitral orifice. The pressure in the left auricle is also greatly raised and is an important factor in maintaining as rapid a flow of blood as possible through the narrow orifice during diastole. When the right ventricle fails, the pressure in the left ventricle falls and the supply of blood to the left ventricle becomes even more insufficient and irregular. The beneficial action of digitalis in such a case may well be explained by its effect in restoring the tonicity and efficient action of the right ventricle, which is the important factor in maintaining a working circulation. A time must come, however, in severe cases of mitral stenosis at which the almost impassable barrier of the button-hole mitral orifice causes a complete breakdown of the right ventricle, and neither digitalis nor any other drug is of any use in averting the final catastrophe.

To take another point. How is it that digitalis, which has such a beneficial effect in auricular fibrillation, is of no service in paroxysmal tachycardia, Graves's disease, or, indeed, in any other form of tachycardia? If it can arrest impulses from auricle to ventricle with beneficial results, as is postulated in auricular fibrillation, why does it fail in the latter group?

The modern conception of heart failure seems to ignore the important fact that there is a right and a left side of the heart, and that we may have failure either of the right or left ventricle, not necessarily of both. In mitral disease the stress falls on the right ventricle, in Bright's disease or high tension in the peripheral circulation on the left ventricle. In the former we get right heart failure eventually, in the latter left heart failure if the patient survives other accidents. In each instance the ventricle, which has most work to do, hypertrophies to meet the extra strain, and digitalis when administered will naturally have its preponderating effect on the side which has the larger mass of muscle.

The inhibitory mechanism of the vagus on the heart has been described as analogous to reins in the hands of a skilled driver controlling a regularly trotting horse. If the horse is exhausted and nearly dead-beat no amount of pulling on the reins will help him on his way; what he needs is a powerful pick-me-up. In the pathological conditions of the heart to which I have alluded above, digitalis, if I may so interpret Professor Cushny's results, appears to act as a direct pick-me-up for the exhausted heart muscle rather than as a stimulus to the inhibitory mechanism of the vagus. This is what we might expect from Nature's common-sense methods.

There are many other questions of interest raised by Sir R. Douglas Powell, Dr. Colbeck, and Dr. Alexander Morison in their letters to THE LANCET of June 9th and 16th, amongst them the question of back pressure and the significance of cardiac murmurs. The disastrous effects of back pressure on the lungs in mitral stenosis are so self-evident, both from the pathological and clinical standpoints, that I do not think it is necessary to dwell on them. As regards the significance of murmurs, every clinician knows that the presence of a mitral systolic murmur in itself may be of little importance; what really matters is the degree in which the functional capacity of the heart is impaired, and this one can easily judge by the response of the heart to increased work on exertion and whether or no cardiac symptoms are readily induced thereby. But one cannot afford to ignore the grave effects in mitral stenosis or aortic lesions of any serious degree on the hydraulics of circulation and the mechanical embarrassment of the heart entailed thereby, apart from other considerations.

That work of the greatest importance has been done by Sir James Mackenzie by his polygraphic tracings and by Lewis with the electrocardiograph in elucidating the problems of heart-block, extra-systole, and sinus arrhythmia I should be the first to admit, but for the reasons given above I am unable to accept in its entirety the doctrine of auricular fibrillation.—I am, Sir, yours faithfully,

JOHN F. H. BROADBENT.

Seymour-street, W., June 18th, 1917.

THE USE OF POLYVALENT VACCINES IN DYSENTERY.

To the Editor of THE LANCET.

SIR,—As a result of the investigations of Dr. J. H. Harvey Pirie on the bacilli causing dysentery in African natives in the Carrier Corps depôt at Nairobi, it was decided to try the effect of a polyvalent vaccine as a therapeutic measure. From the literature available it appeared that the drawback to antidysenteric vaccines was their extremely toxic character. It was thought that possibly the heat used to sterilise the vaccines might be in some way a cause of this toxicity and it was decided to try to prepare a vaccine sterilised by antiseptics alone.

The first antiseptic tried was eusol, but, although the solution was freshly prepared, it was found that it failed to sterilise the cultures, even when added in large doses. Recourse was then had to 0·4 per cent. carbolic acid, the antiseptic employed in this laboratory in the preparation of autogenous vaccines. It was found that the addition of this strength of carbolic acid brought about complete sterilisation in about two days.

Dr. Pirie selected from his stock of local strains a Shiga bacillus and bacillus of the Morgan type. These were incubated in peptone broth for 48 hours at 37° C. The cultures were then carbolised and tested for sterility after 48 hours. The vaccine was administered to Africans

suffering from dysentery at the Carrier Depôt Hospital, Nairobi, and it was found to cause no toxic symptoms. The treatment was begun on Sept. 1st, 1916, and since then 350 cases have been treated or are under treatment at the time of writing. The results have been most promising, and at a later date it is proposed to publish complete statistics. The majority of cases respond immediately, and others which do not show much marked improvement are often complicated by bilharziasis.

The vaccine has since had a bacillus of the type Flexner added, with improved results. It now consists of six different strains in the following proportions: *B. Shiga*, 1 part; bacillus resembling *B. Shiga* in all its sugar reactions, but motile, 1 part; bacillus of the *B. Flexner* type, 1 part; three different strains of the *B. Morgan* type, 3 parts. The cultures are made in flasks of peptone broth and grown for three days at 37° C. They are then carbolised, tested for sterility after two days, mixed in the above proportions and issued as required.

Therapeutic inoculation was first attempted with a dose of 5,000,000 *B. Shiga* and 5,000,000 of mixed strains of *B. Morgan* type, increasing by 5,000,000 daily, but it was found that more satisfactory results were obtained with large doses at longer intervals. The usual dose at present is 1 c.c. of the vaccine, made in the manner and proportions described above, on the day of admission. On the eighth day 2 c.c. are injected subcutaneously; on the fifteenth day 3 c.c. and, if necessary, on the twenty-second day 4 c.c. Still larger doses are being tried at the time of writing, but it is too early yet to form an opinion as to whether these bigger doses are advisable or not.

In addition to the use of the vaccine as a therapeutic measure African porters passing through Nairobi Depôt are being submitted to prophylactic inoculation. Unfortunately, so far no figures are available to show whether this inoculation is of any value or not.

We are, Sir, yours faithfully,

PHILIP H. ROSS,
Director of Laboratories, British East Africa; Honorary Adviser to the Director of Medical Services, E.A.F.

W. H. KAUNTZE,
Captain, West African Medical Staff (attached East African Medical Service).

THE POPULATION OF ASYLUMS FOR THE INSANE.

To the Editor of THE LANCET.

SIR,—For some time past the *Daily Graphic* has been publishing articles vituperating public asylums and all connected with them. On June 13th this newspaper prints a long article entitled "Heroes in Asylums." Nearly one-half of this is taken up with the correspondence of a person who writes: "I have been detained by the Lunacy Commissioners ever since December, 1905, as a lunatic." Further on it states that a patient was visited by a *Daily Graphic* representative, who we must suppose is an expert, and who could find nothing the matter except "twitching of the nerves (*sic*) and a highly strung manner which is typical of nervous patients." This kind of nonsense has been read by many and if no reply is made the public naturally say that "silence is consent." Writing to the *Daily Graphic* has been tried, but the letter was not inserted. I am writing therefore to crave the indulgence of your columns and to state that the article in question contains numerous inaccuracies, to put it as mildly as possible. This information is not needed by your readers, but I am hoping that through the instrumentality of medical men the public may learn where the truth lies. In the *Times* on the same day a coroner is reported to have stated that it was a scandal that so many insane patients were discharged from asylums.

I am, Sir, yours faithfully,

R. H. STEEN.

City of London Mental Hospital, near Dartford, Kent, June 15th, 1917.

IRISH MEDICAL ASSOCIATION.—The annual general meeting of this association was held on June 14th, Dr. R. Marlay Blake presiding. Some discussion took place with reference to the Midwives Bill for Ireland which has been drafted by the Local Government Board, and the opinion was expressed that the Bill should be submitted to the medical profession before being introduced to Parliament.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Capt. F. J. H. T. Frere, M.C., R.A.M.C., qualified at Durham in 1913 and held the appointment of house surgeon at Newcastle Royal Infirmary. He joined the R.A.M.C. on the outbreak of war and saw service in Gallipoli. The award of the Military Cross was announced in THE LANCET of Feb. 5th, 1916, p. 321.

Capt. O. Hairsine, M.C., R.A.M.C., was a student at Middlesex Hospital, and qualified in 1914, just prior to the outbreak of war, and thereupon joined the R.A.M.C. Capt. Hairsine was in the retreat from Mons, and the award of his Military Cross was recorded in THE LANCET of Jan. 22nd, 1916, p. 215.

Capt. L. E. Clark, Canadian A.M.C.

Capt. D. R. King, R.A.M.C., qualified at Glasgow in 1914 and shortly afterwards joined up.

Died of Wounds.

Lieut. W. A. Smith, R.A.M.C., attached Royal Field Artillery.

Wounded.

Capt. O. De Muth, R.A.M.C.
Lieut. A. G. H. Smart, R.A.M.C.
Capt. W. M. Cox, R.A.M.C.
Capt. A. C. Giles, R.A.M.C., attached S. Lanc. Regt.
Capt. J. McMillan, R.A.M.C., attached M.G.C.
Col. A. W. N. Bowen, R.A.M.C.
Capt. P. Hudson, R.A.M.C., attached Hamps. Regt.
Capt. W. B. Loveless, R.A.M.C., attached R. W. Regt.
Capt. H. C. D. Miller, R.A.M.C.
Capt. C. Witts, M.C., R.A.M.C., attached High. L.I.
Capt. K. J. Yeo, R.A.M.C., attached M.G.C.
Capt. J. J. Sinclair, R.A.M.C.
Capt. C. H. Carlton, R.A.M.C., attached London Regt.
Capt. A. J. McCreadie, R.A.M.C., attached Border Regt.
Capt. A. C. Court, R.A.M.C.
Capt. R. O. H. Jones, R.A.M.C.
Capt. J. Marshall, New Zealand M.C.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported:—

Second Lieutenant C. P. Lewis, Royal Engineers, killed in action, only son of Dr. P. Lewis, of Brixton-hill, London, S.W.

Second Lieutenant I. H. McCaw, Royal Irish Rifles, wounded, only son of Dr. J. McCaw, of Dublin-road, Belfast.

Second Lieutenant C. L. Green, Essex Regt., attached Royal Flying Corps, killed in action, elder son of Dr. E. F. S. Green, of South Norwood, London, S.E.

THE REMUNERATION OF THE MEDICAL STAFFS OF V.A.D. HOSPITALS.

It is now some time since Dr. Howard Marshall raised the question in a letter to the *Times* of the remuneration of the medical staffs of V.A.D. hospitals, but nothing has been done to place the position of these officers on a satisfactory basis. It has come out, mainly as the result of Dr. Marshall's action, that two years ago a form was issued, under the authority of a War Office letter, to the various commands, in accordance with which remuneration could be claimed by the medical officers of V.A.D. hospitals, but the existence of the form was not made known to the medical officers. Further, the remuneration, when given to certain of the officers, was construed as a private transaction. It may be that many medical officers of V.A.D. hospitals are prepared to give their services gratuitously and to defray their own out-of-pocket expenses, but to many others this must be a grave hardship. The whole question has for some time been under the consideration of the Central Medical War Committee, and it is essentially one where the War Office authorities should be ready to coöperate with that body and other representative bodies in putting matters on a sound financial footing.

OBITUARY OF THE WAR.

PERCY EAST LONES, M.R.C.S. ENG.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain P. E. Lones, who was killed in action on April 28th, at the age of 30, was the only surviving son of Dr. T. E. Lones, of H.M. Patent Office, and King's Langley, Herts. Educated at Watford, Dudley, and University College, London, he received his medical training at University College Hospital. Joining the University of London O.T.C. in August, 1914, he obtained the qualification of the Conjoint Board in the following January, and his commission in the R.A.M.C. a month later. In March, 1916, he left for India attached to the 1st Durham Light Infantry, and saw service in the Mohmand rising. Returning to England last February, he was sent to France, where he was killed instantaneously by a shell when in command of the bearers at a regimental aid-post.



Captain Lones was by nature courageous. Swimming was his chief sport, and in the summer of 1910 he saved a boy from drowning in the Thames. His senior officer writes of him as a reliable officer whose loss was keenly felt by the division. "Brave to a fault, always content, no matter what his lot. We all considered him a great acquisition to the ambulance." Captain Lones married Marian, daughter of Edward Wadsworth, of Harlesden, and leaves a widow and an infant daughter.

FREDERICK HUNTON, M.D., B.S. DURH.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain F. Hunton, who fell in action in Palestine on May 5th, was 48 years of age and a native of Stockton-on-Tees. He was educated at the Bishop Auckland Grammar School, taking his M.B., B.S. Durh., in 1891, from the College of Medicine in Newcastle-upon-Tyne, and his M.D. degree two years later. After acting as assistant to Dr. Blandford, of Norton, for four years, he became resident medical officer to the Stockton-on-Tees Union Hospital till 1898, when he purchased a practice at Sedgefield, co. Durham, becoming medical officer of health to the rural district, and continuing there till 1914, when he volunteered for active service in Egypt, and received a commission in the R.A.M.C., T., attached to the Northumberland Hussars, but was posted to the 53rd Welsh Casualty Clearing Station. After seeing the wounded come in from recent actions near Gaza, and on one occasion working amongst them for 84 hours at a stretch with only four hours' sleep, he was running to succour the men who were wounded during a bombing raid when he himself received a piece of the bomb, which pierced his chest and killed him instantaneously.



A medical friend writes of Captain Hunton:—"He was the ideal of a country practitioner, and by his cheery courage his professional skill, and his sterling character, he exercised a wide influence for good. He was one of those who loved the country. 'I know every tree on my rounds, and I shake hands with them as I pass,' he was wont to say, and being a great huntsman the winter in the South Durham country had its special charm for him. But before hunting he always did his round of patients, and duty was never better done, nor work more faithfully accomplished than by Hunton. Few men underwent more accidents: he broke his femur at football and had 1½ in. of shortening in one limb; he broke his collar-bone on a bicycle; he fractured his ribs on at least two occasions; and he had one kidney removed after a hunting accident. After joining the Army he had a comminuted fracture of the tibia, which was plated and recovered. I have never met a braver man, and in addition to overflowing physical courage he possessed moral courage in an equal degree. He asked only the question, 'Is it right?' and when satisfied he did not know fear." Captain Hunton was twice married and leaves a son and four daughters.

PERCY HERBERT BURTON, M.R.C.S. ENG.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain P. H. Burton, who was killed in action in France on May 13th, was the youngest son of the late Joseph D. Burton, of Cambridge Heath. He studied medicine at the London Hospital, where he became surgical clinical assistant qualifying in 1914. Shortly after the outbreak of war he offered his services to the War Office and was attached to the London Regiment, with which he served continuously, first in this country and latterly in France, from the beginning of 1915 to the date of his death. He had only returned to his battalion, after a short period of leave, four days before he fell. Of a consistently cheery and bright disposition, Captain Burton possessed an inherited and intuitive love for his work, which had an absorbing interest for him beyond that of professional duty. Letters from his superior officers testify to the value which these qualities conferred on his work as a military medical officer. Captain Burton leaves a widow but no children.



CHARLES RYLEY, M.R.C.S. ENG., D.P.H.,

MAJOR, ROYAL ARMY MEDICAL CORPS.

Major C. Ryley, who died on active service on May 4th, was only son of the late Charles Ryley, sometime of New Zealand. He took his medical course at St. Mary's Hospital, qualifying in 1901, and holding resident appointments there and at the Paddington Green Hospital for Children. In 1904 he joined the Royal Army Medical Corps, and after seeing service in China and Bermuda was sent to France in 1916 as Deputy Assistant Director of Medical Services. After an attack of pericarditis in July he never recovered his health completely, but insisted on remaining at his work, "always cheerful and amusing," according to the testimony of his colleagues. Finally he collapsed while on horseback and fell to the ground, being found dead when he was picked up. Major Ryley married in 1905 Christine, daughter of Major John Francis O'Brien, and leaves a widow and two sons.

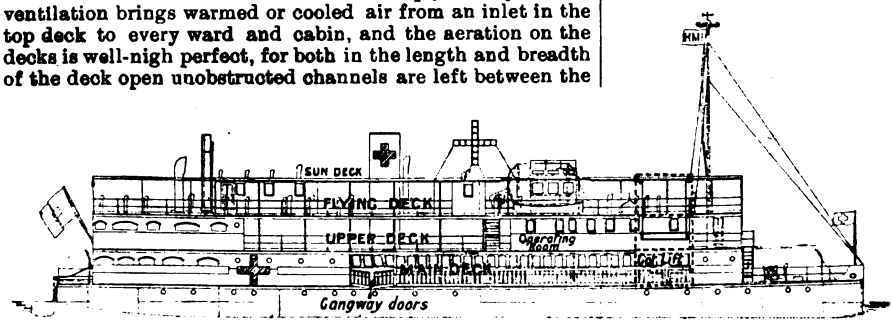


MIDDLESEX HOSPITAL MOBILISATION CENTRE.

The officer personnel of the unit authorised by the War Office to be raised at the Middlesex Hospital Mobilisation Centre by Lieutenant-Colonel Sir James K. Fowler is complete. A supplementary list has been formed from which vacancies will be filled as they arise. This list remains open. Many offers which could not be accepted have been received from men beyond the limit of age for service abroad. Nurses and V.A.D.'s trained at the Middlesex Hospital are still required for service with this unit. The age-limit is 45 years. Applications should be addressed to the Lady Superintendent, Middlesex Hospital, W.

HOSPITAL SHIPS ON THE TIGRIS.

NEWS has recently been received by the British Red Cross of the safe arrival at Basra of the *Nabha*, one of a new fleet of hospital ships built to ply on the upper shallow reaches of the river Tigris. The hospital ship of which we give a profile view below is a similar vessel to the one recently inspected by the King before being sent out. With cot accommodation for some 200 patients, the ship draws less than 3 feet 6 inches of water, and can turn in twice its own length of 160 feet on account of an ingenious quadruple rudder. The main or lower deck, arranged as a hospital for serious cases, can be closed in for warmth—it can be cold as well as hot on the Tigris—while the windows turn on pivots in order to catch any available breeze in the hot weather. A plenum system of ventilation brings warmed or cooled air from an inlet in the top deck to every ward and cabin, and the aeration on the decks is well-nigh perfect, for both in the length and breadth of the deck open unobstructed channels are left between the



Twin Screw Motor Hospital Ship.

cots for the air to circulate freely, while an electric fan is provided for every cabin and for every group of four cots on deck. Gangway doors allow the direct embarkation of fracture cases on to either side of the several decks from which, when necessary, a cot-lift conveys them to the operating theatre on the upper deck. The arrangements have been designed by Lieutenant-Colonel R. M. Carter, I.M.S., to provide perfect comfort for the patients and facilities for their medical care and supervision within a minimum space, and in all this he has been eminently successful. The medical and surgical equipment is specially complete down to an abundant supply of the drugs likely to be required in a tropical country.

CEREBRO-SPINAL FEVER IN CONNEXION WITH THE WAR.

We have received the following report on cerebro-spinal fever in the county of Norfolk for 1915 from Dr. J. T. C. Nash, the county medical officer of health :—

Cerebro-spinal fever has shown a tendency to increase in England and Wales during the last three or four years. In the administrative county of Norfolk in 1915 there were 31 notifications—10 soldiers and 21 civilians. Of the 20 civilian cases of which I have notes, 11 were adult females, and 6 of the remaining 9 were children. Of the 3 males, one was a baker, another a postman, whose occupations might bring them into touch with soldiers. Of the first 10 cases of cerebro-spinal fever notified 6 were soldiers, 1 was the sister of a soldier, himself a victim, and 2 were females who came in contact with soldiers.

The first intimation I had of cerebro-spinal fever in Norfolk was from the military, who informed me, on Jan. 30th, that two cases occurred in troopers in the Aylsham district, who had been removed to the Norfolk and Norwich Hospital on Jan. 26th, and the diagnosis had been confirmed bacteriologically. One man had returned from Wales about a fortnight previously. On Jan. 30th there was also a notification of a case at Cromer—a servant girl who had mixed with soldiers, and of another case, a female, in the Aylsham district who also mixed with soldiers. The next case was a soldier in Freebridge Lynn district, notified on Feb. 6th. On Feb. 20th there was the notification of a farm-hand at Fritton, who was taken ill on Feb. 9th and developed symptoms of "brain fever" on Feb. 12th; he was removed to the Norfolk and Norwich Hospital, where he died 36 hours later. A post-mortem examination showed the presence of cerebro-spinal meningitis, but the meningococcus failed to grow from the cerebro-spinal fluid taken after death. No examination had been made during life.

The next case notified, on Feb. 21st, was a soldier who came home to Wymondham on leave from Felixstowe on Feb. 6th. He fell ill suddenly on the 8th and was first thought to be suffering from enteric fever. My attention was asked on Feb. 22nd. On Feb. 23rd he was removed with his sister (also now suffering from cerebro-spinal fever—confirmed by bacteriological examination of cerebro-spinal fluid) to hospital. On March 6th I had a notification of a *military* case at Hunstanton, and of another *military* case at Hilgay Fen, Downham. (This man had come from Felixstowe.) A further military case was notified from King's Lynn on March 13th, and yet another soldier from Thetford on March 22nd.

As I informed Dr. Farrar, of the Local Government Board, on this date, there had been up to this time 10 notifications of cerebro-spinal fever in the administrative county of Norfolk—4 in January (2 soldiers), 3 in February (2 soldiers and 1 civilian—a sister of one of the affected soldiers), and 2 in March (both soldiers). The other civilian case was the case diagnosed on post-mortem examination at the hospital. On March 27th a child, aged 4, was notified from a village in Walsingham rural district in which troops were billeted; and on the same date a military case was notified from Sheringham. On March 30th a female civilian case was notified from Brundall, near Norwich, and a male civilian case (a postman) from Cromer.

On March 31st, 1915, I sent a circular letter to all the district medical officers of health pointing out that cases of cerebro-spinal fever were occurring mostly among troops, and stating that the military authorities had made arrangements with Dr. G. P. C. Claridge, of St. Giles Plain, Norwich, to make bacteriological examinations of suspected cases and contacts. As a result Dr. Claridge's services were arranged for in all districts where they were required or where there was any likelihood of cases of cerebro-spinal fever occurring.

On April 1st I received a military communication that a military servant who had been at Thurlton, near Loddon, had fallen ill with cerebro-spinal fever at Camberley. A suspected civilian case on April 4th was not confirmed by bacteriological examination. On April 6th a female child, aged 9, was notified at Loddon. The house had been visited by a soldier relative a few days previously. On April 8th a male civilian (baker) was notified in the Aylsham district. On April 12th I received a notification of a female (husband a soldier who had visited her eight days previously) in Erpingham district, near Cromer. On April 15th a female, aged 21, was notified from the Marshland district. She had been in contact with soldiers in King's Lynn. On April 17th a military case was notified from Diss; inquiries showed that he was merely *en passant* from Oakley to Cambridge. On April 26th a notification was received from London of an officer who had recently been at Loddon (Norfolk). Swabbing of military contacts in Norfolk showed a few "carriers" (13 ?). The officer had left Norfolk ill on the 16th. (This case, the Camberley case, and the Loddon child notified on April 6th have apparently something in common.) On May 1st a civilian case was notified from Depwade. No further cases were reported during May. The particulars to this date show 10 military and 12 civilian cases (9 females, 3 males), all of the latter having more or less intimate relations with

soldiers. The sex incidence among civilian cases is noteworthy.

This completes the first chapter of the history of cerebro-spinal fever in Norfolk; the rest of the story can be summarised as follows:—

Chapter 2.—A period of six weeks having elapsed, a notification of cerebro-spinal meningitis in a female child, aged 2, was received on June 12th from the Freebridge Lynn district. Soldiers billeted about two miles away. On June 19th a notification was received of a male civilian case from West Lynn. The man had come from Hunstanton, where troops were stationed and where a military case was notified in March. These two cases were in north-west Norfolk.

Chapter 3.—A period of about two and a half months having elapsed, two children at Long Stratton were notified as suffering from cerebro-spinal fever on August 28th, and on the same date a military case was notified from King's Lynn.

Chapter 4.—No further cases for two months; then 3 cases in one house, notified on Oct. 30th, Nov. 6th, and Nov. 17th respectively—all females (one a baby). Contact of the first case with a soldier was clearly established; the others were house contacts.

Chapter 5.—The last notification of cerebro-spinal fever in the year was that of a male civilian, a solicitor living near and frequently in Norwich. Exact source of infection was not traced, but cases and carriers were occurring from time to time in Norwich. Thus, in the last half of the year 7 cases were notified, of which only 1 was a soldier. Of the six civilian cases 3 were young children, 2 were adult females, and 1 an adult male.

The history of the incidence of the disease during the year indicates a gradual transference from the military to the civilian section of the population, the first few cases being either soldiers or intimately connected with soldiers. Later no doubt a vicious circle was established—soldiers and civilians affecting each other.

The difficulty in dealing with outbreaks of cerebro-spinal fever lies chiefly in the fact that for every case there are generally found numerous "carriers" of the germ among the contacts. These have all to be subject to bacteriological examination, quarantine, and some form of treatment. It would not be difficult to overlook a carrier, and the manner in which the disease was held in check speaks volumes for the efficient aid given by Dr. Claridge.

THE HONOURS LIST.

The following awards to medical officers are announced:—

Distinguished Service Order.

Major Robert Thornton Meadows, R.A.M.C.

For gallant and meritorious service on the occasion of the mining of a hospital ship.

Capt. Ernest Stanley Stork, R.A.M.C., attached Yeomanry.

For conspicuous gallantry and devotion to duty. He displayed untiring energy and devotion to duty in evacuating a large number of wounded under heavy fire. He set a magnificent example of courage and determination.

Capt. (temp. Major) Alfred Charles Foster Turner, R.A.M.C.

For conspicuous gallantry and devotion to duty. He attended wounded under heavy fire day and night without rest. He was ever present along the line from the A.D.S. to the most advanced trenches, and on several occasions faced enemy artillery barrages in order that reserves of stretcher-bearers might reach their objectives.

Capt. William Ferguson Wood, R.A.M.C., Spec. Res., attached Hussars.

For conspicuous gallantry and devotion to duty. Under most trying circumstances and heavy fire he collected and tended the wounded without rest or food. He frequently made dangerous tours looking for wounded men.

Bar to the Military Cross.

Capt. James Alwin Colville Scott, M.C., R.A.M.C., attached Durham Light Infantry.

For conspicuous gallantry and devotion to duty. He behaved with great courage and coolness in attending the wounded under heavy shell fire. For two days he worked continuously, with an utter disregard for his own safety. By his efforts he was able to ensure the rapid evacuation of the wounded, and undoubtedly saved many lives. (The award of the Military Cross was announced in THE LANCET of Jan. 6th, 1917, p. 38.)

Military Cross.

Temp. Capt. Vincent Edgar Badcock, R.A.M.C., attached Highland Light Infantry.

For conspicuous gallantry and devotion to duty. He has behaved in a most gallant manner on several occasions in attending to wounded under intense shell fire, showing an utter disregard of personal danger, and setting a fine example to all.

Temp. Capt. James Harding Barry, R.A.M.C., attached London Regiment.

For conspicuous gallantry and devotion to duty. He showed the utmost coolness and bravery in going out under heavy machine-gun fire and assisting to bring in and attend wounded men. Throughout he set a splendid example to all.

Temp. Capt. Bertram Henry Barton, R.A.M.C.

For conspicuous gallantry and devotion to duty. He worked continuously under very heavy fire, and succeeded in bringing in many wounded men. His devotion to duty saved many lives.

Temp. Capt. Eric Biddle, R.A.M.C.

For conspicuous gallantry and devotion to duty. He showed great gallantry in supervising the removal of wounded from a heavily shelled area. By his untiring energy and disregard of personal danger he saved many lives.

Capt. Richard Thompson Cæsar, R.A.M.C.

For conspicuous gallantry and devotion to duty. On taking over the line, the cellars of the village were full of wounded. He proceeded with bearers to search all the cellars and organised removal of patients. Although the shelling was heavy and practically continuous, he remained all day and succeeded in clearing the village of all wounded.

Temp. Capt. John Donal Carroll, R.A.M.C., attached Royal Warwickshire Regiment.

For conspicuous gallantry and devotion to duty. An observation post had been hit, he immediately went to the spot and attended the wounded, although the enemy continued to concentrate heavy shell fire on the post.

Temp. Capt. James Alphonsus Conway, R.A.M.C., attached Oxford and Bucks Light Infantry.

For conspicuous gallantry and devotion to duty. He worked indefatigably under heavy fire, and by his personal attention saved the lives of a number of men. He set a fine example to all ranks.

Temp. Lieut. A. Yeshwant Dabholkar, I.M.S.

For conspicuous gallantry and devotion to duty. Although himself wounded, he displayed great courage and determination in tending wounded men under heavy fire. He set a splendid example to those around him.

Temp. Lieut. Erach Ruttonji Daboo, I.M.S.

For conspicuous gallantry and devotion to duty. He went forward at great personal risk and dressed many wounded men under very heavy fire. He was himself wounded.

(The award of the Military Cross to Temp. Lieut. Dabholkar and Temp. Lieut. Daboo has been announced in a previous issue of THE LANCET, and the deeds are now added.)

Temp. Capt. Oswald John Day, R.A.M.C.

For conspicuous gallantry and devotion to duty. He worked continuously under very heavy fire, and was responsible for the evacuation of a large number of wounded.

Capt. Walter Elliot Elliot, R.A.M.C., Spec. Res., attached Dragoons.

For conspicuous gallantry and devotion to duty. He worked continuously throughout the night tending the wounded under heavy fire. His devotion to duty saved many lives.

Capt. Henry William Evans, R.A.M.C., Spec. Res.

For conspicuous gallantry and devotion to duty. He showed the utmost bravery and zeal when commanding a stretcher-bearer division. He directed the bearers and tended the wounded in the open. By his exertions he secured the efficient clearing of the wounded over very long distances.

Capt. Alfred George Timbrell Fisher, R.A.M.C.

For conspicuous gallantry and devotion to duty. The advanced dressing station of which he was in command was destroyed by shell fire, and although himself severely shaken, he succeeded in forming a fresh dressing station.

Temp. Capt. Frederick George Flood, R.A.M.C., Spec. Res.

For conspicuous gallantry and devotion to duty. He displayed great courage and determination in tending the wounded under very heavy fire. His disregard of personal danger inspired all ranks. He has previously done fine work.

Capt. Arthur Stuart Hebblethwaite, R.A.M.C., attached London Regiment.

For conspicuous gallantry and devotion to duty. He organised and trained a detachment of stretcher-bearers and supervised their operation under heavy fire. All casualties were cleared within a short time of the completion of the operations. This was due to the excellent training and example set by this officer.

Temp. Capt. Daniel Kennedy, R.A.M.C., attached Lancers.

For conspicuous gallantry and devotion to duty. He tended the wounded under very heavy machine-gun shell fire, to which he was continually exposed. It was owing to his bravery and untiring devotion that many lives were saved.

Temp. Capt. John Low, R.A.M.C.

For conspicuous gallantry and devotion to duty. He brought forward his bearer subdivision and established a dressing station under heavy fire, thereby relieving the regimental aid-posts. He worked continuously for 36 hours.

Capt. Gilbert Moore, R.A.M.C.

For conspicuous gallantry and devotion to duty. He was in command of the evacuation of the wounded for several weeks on an advanced front. He displayed skill in working his dispositions, and personally superintended the evacuation under heavy shell fire.

Capt. William Fraser Munro, R.A.M.C.

For conspicuous gallantry and devotion to duty. He worked continuously for 48 hours under very heavy fire, and was responsible for the evacuation of a large number of wounded. He set a splendid example to all ranks.

Capt. John Dover Proud, R.A.M.C., Spec. Res.

For conspicuous gallantry and devotion to duty. He worked continuously for 48 hours under heavy fire and succeeded in bringing in many wounded men.

Temp. Capt. Arthur Wilmot Raymond, R.A.M.C.

For conspicuous gallantry and devotion to duty. He organised and led a rescue party to dig out some men partially buried by the explosion of a shell in a captured enemy gun-pit. He set a splendid example of courage and determination.

Temp. Capt. Arthur Paul Saint, R.A.M.C., attached King's Royal Rifle Corps.

For conspicuous gallantry and devotion to duty. He displayed great courage and determination in tending the wounded under heavy fire. His devotion to duty saved many lives.

Temp. Capt. Humphrey Meigh Stephenson, R.A.M.C., attached Rifle Brigade.

For conspicuous gallantry and devotion to duty. He tended the wounded under heavy fire, and showed a complete disregard for his personal safety. He set a magnificent example throughout.

Temp. Capt. James Williamson Tocher, R.A.M.C.

For conspicuous gallantry and devotion to duty. He displayed great courage and determination in attending to wounded for many hours during an intense hostile bombardment. He set a fine example to all ranks.

Temp. Capt. Frank Muir Walker, R.A.M.C., attached Royal Horse Artillery (Lieut. C.A.M.C.).

For conspicuous gallantry and devotion to duty. He has displayed the utmost gallantry and devotion to duty when under heavy fire. Particularly when he went through a heavy barrage to some wounded men, and tended them in the open for an hour.

Temp. Capt. Thomas Arnold Watson, R.A.M.C., attached King's Royal Rifle Corps.

For conspicuous gallantry and devotion to duty. He displayed great courage and determination in tending the wounded under heavy fire. His devotion to duty saved many lives.

Capt. Charles Owen James Young, R.A.M.C., Spec. Res.

For conspicuous gallantry and devotion to duty. He went out under heavy shell fire and attended several wounded men in the open. He has on previous occasions shown fine disregard of personal danger in the face of heavy fire.

Capt. William Robert Aspinall, Australian A.M.C., attached Field Artillery.

For conspicuous gallantry and devotion to duty. He displayed the utmost courage and devotion in tending the wounded under heavy fire, and assisting them to places of safety until they could be evacuated. He showed the greatest gallantry throughout.

Capt. Ronald Lennox Henderson, Australian A.M.C., attached Infantry.

For conspicuous gallantry and devotion to duty. He displayed great courage and determination in tending the wounded under very heavy fire. His devotion to duty saved many lives.

Capt. William Duncan Kirkland, Australian A.M.C., attached Field Artillery.

For conspicuous gallantry and devotion to duty. During hostile shelling two ammunition dumps were set on fire also causing several casualties. He immediately went to the assistance of the wounded, and, regardless of heavy shell fire and numerous explosions, dressed their wounds. He has at all times set a fine example.

Capt. Stanley Vincent O'Regan, Australian A.M.C., attached Infantry.

For conspicuous gallantry and devotion to duty. He worked continuously throughout the day tending to the wounded under very heavy fire. He set a fine example to all ranks.

Capt. Hugh Alexander Wyllie, Australian A.M.C., attached Infantry.

For conspicuous gallantry and devotion to duty. He tended the wounded continuously for two days under heavy fire. He set a splendid example of courage and determination.

GIFTS OF AMBULANCE WAGONS.—Motor ambulance wagons of various types which have been presented to the Scottish Branch of the Red Cross Society were on view in Glasgow lately, and were formally handed over in the transport headquarters there. The wagons consist of a field kitchen, a workshop, two vans for carrying supplies, two Red Cross wagons, and an ambulance with accommodation for four cot cases, the gifts of the Scottish Coal Owners and the National Union of Mine Workers in Scotland. A mobile X ray wagon, with complete equipment, was furnished by the Scottish Farmers' Union, and a dental wagon by an anonymous donor.

THE LANCET, VOL. I., 1917: THE INDEX.

THE Index and Title-page to the volume of THE LANCET completed with the issue of June 30th will be ready in July. Owing to the continued shortage in the paper supply, the Index will not be issued with all copies of THE LANCET, as was the custom prior to the War. Subscribers who bind up their numbers are requested to send a post-card to the Manager, THE LANCET Office, 423, Strand, London, W.C. 2, when a copy of the Index and Title-page will be supplied free of charge.

THE SERVICES.

ARMY MEDICAL SERVICE.

Major (temp. Lieut.-Col.) H. A. Ballance, R.A.M.C., T.F., to be temporary Colonel.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. O. W. A. Elsner, D.S.O., to be temporary Colonel whilst employed as Assistant Director of Medical Services of a Division.

Lieut.-Col. E. M. Morphew, D.S.O., to be temporary Colonel whilst Assistant Director of Medical Services of a Division.

Temp. Lieut.-Col. G. S. Buchanan, having resigned his appointment, reverts to the rank of temporary Honorary Lieutenant-Colonel.

To be acting Lieutenant-Colonels: Capt. W. H. C. Lunn whilst in command of a Field Ambulance and Major Thomas B. Unwin whilst in command of a Stationary Hospital.

Major Albert E. B. Wood relinquishes the acting rank of Lieutenant-Colonel on reposting.

Temp. Major A. M. Leake, V.C., to be acting Lieutenant-Colonel whilst in command of a Field Ambulance.

To be Temp. Majors: W. L. Braddon and Temp. Capt. H. S. Raper.

Temp. Lieut. P. J. O'Sullivan to be temporary Captain.

To be Temporary Captains: E. T. C. Milligan, H. D. Duke, R. Friell, G. R. Lawless, R. F. Yencken, A. Burton, C. R. Smith, J. Pugh, L. Bromley, C. W. B. Littlejohn, A. Fletcher.

To be temporary Lieutenants: J. Glaister, E. J. Stuckey, R. G. Struthers, J. Cullen, W. M. McDonald, R. E. V. Hale, G. Adam, J. A. Valentine, H. Daw, T. D. Webster, J. W. Trevan, J. C. Marshall, J. J. Keyns, P. J. Verrall, B. Hart, F. E. Higgins, J. B. Cooke, C. E. Lowe, S. C. Wilkinson, C. C. W. Pasco, F. Wilkinson, G. I. Cumberlege, J. H. Trench, J. L. Green, F. B. Penfold, A. M. A. James, D. S. Macbean, H. E. Jones, G. Hardwicke, H. A. De Morgan, E. L. M. Lobb, W. R. O'Keefe, H. W. Fisher, C. E. Waldron, D. M. Ross, A. T. W. Forrester, N. R. Ussher, S. P. Rowlands, C. C. W. Mays, A. Macdonald, G. S. Ewen, G. A. J. M. Loughnan, J. A. Wood, G. B. P. Davis, W. B. Blandy, F. W. W. Smith, P. O. Moffat, J. S. Higgs, S. Carter, H. W. Elwell, G. P. Young, A. H. McCandlish, G. W. Sudlow, C. H. Waddell, R. H. Robbins, S. McMurray, G. S. Robertson, R. K. Robertson, H. F. Warner, S. C. Shanks, C. Murray, W. S. George, G. Chalmers, R. Jamison, T. S. D. Enderby, F. L. Brewer, L. W. Roberts, W. B. H. Dundee, W. MacKenzie, L. Fern, H. G. Rashleigh, R. W. D. Hewson, J. G. Cooper, D. M. Bochan, W. Sanderson, F. Atthill, H. G. Drake-Brockman, T. J. George, J. F. Weston, F. Whincup, A. Emerson, H. A. Whitcombe, P. Hall-Smith, H. L. Galletly, W. A. Elwood, E. A. A. Saunders, A. I. Cooke, H. E. Heapy, J. C. Mann, F. W. Ritson, R. G. Smyth, L. B. Perry, F. Thompson, E. B. M. Price, J. A. MacKenzie, J. F. Douse, E. Wight, R. Gauld, G. M. Davies, J. A. Ross, R. C. Cummings, F. Talbot, J. E. Scott, S. Slade, A. J. Rae, A. Mason, J. H. Nichol, J. D. Bridger, J. P. McGowan, F. H. R. Heath, D. C. Dobell, T. E. Banister, C. I. Milne, A. H. John, J. Renwick, F. E. Wilson, H. A. Lyth, C. H. Pepper, A. G. H. Lovell, A. R. F. Hay, W. A. D. King, S. C. Ellison, A. F. R. Conder, A. Gilchrist, G. H. Shaw, J. Donaldson, A. L. Robinson, G. A. Johnstone, A. W. F. Edmonds, L. W. Shadwell, J. G. Macqueen, J. Brydon, A. J. McConnell, R. S. Frew, J. L. Hawkes, J. B. Macalilan, C. H. Wilson, J. A. Durant, H. Brayshaw, R. G. Barlow, H. A. Williams, J. Jeffrey, M. W. Cantor, H. V. Swindale, H. N. Matthews, N. Morris, J. A. M. Clark, J. Dick, J. A. Currell, T. C. MacKenzie, J. A. Struthers, F. C. Morgan, W. P. Over, G. A. F. Heyworth, G. V. Anderson, A. Leeming, J. Menton, F. J. Child, C. A. A. Dighton, C. G. MacMahon, E. J. Fisher, R. H. Robinson, J. H. Moore, W. H. Bush, J. A. Jamieson, K. C. Edwards, A. C. Brown, R. H. Dixon, W. N. May, L. M. Markham, H. Christal, A. Gregory, W. M. T. Wilson, M. R. Dobson, L. S. Hooper, R. M. Erskine, R. Robertson, J. D. Clay, L. H. Burner, R. B. Radcliffe, J. Tait, J. C. L. Day, A. C. Sturrock, D. Gray, A. B. Rooke, H. E. Martyn, J. B. Sandilands, A. B. Robertson.

The undermentioned are granted temporary honorary rank whilst serving with the Irish Counties War Hospital: As Lieut.-Colonel: S. S. Pringle. As Major: W. G. Harvey. As Captain: H. de Lisle Crawford.

T. H. Brown, late temporary Lieutenant, to be honorary Lieutenant.

Officers relinquishing their commissions: Temp. Lieut.-Col. A. S. Woodwark (granted the rank of Lieutenant-Colonel). Temporary Captains: L. M. Breton (on account of ill-health), J. F. MacKenzie (on account of ill-health), A. Renshaw, E. V. Frederick, R. H. Drennan (on account of ill-health). Temporary Lieutenants: C. E. L. Burman, H. L. Craig, G. H. Clement, L. W. Kergin, J. S. Strachan (on account of ill-health).

SPECIAL RESERVE OF OFFICERS.

Lieuts. W. B. Wilson and J. B. Hume to be Captains.

To be Lieutenants: L. Jefferson (from Queen's University, Belfast Contingent, O.T.C.); W. H. White, D. J. H. Jones, and J. Braun (from University of London Contingent, O.T.C.); W. R. Matthewson (from Edinburgh University Contingent, O.T.C.); R. N. Burton.

Major H. G. Smeeth relinquishes the active rank of Lieutenant-Colonel on reposting.

TERRITORIAL FORCE.

Majors to be temporary Lieutenant-Colonels: D. J. Graham, F. D. Boyd, C.M.G., J. G. Andrew, R. A. Veale, J. H. Ray.

Major J. Ward to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Captains to be temporary Majors: W. E. Alderson, L. G. J. Mackay, A. R. Bearn, H. B. Whitehouse, W. B. Secretan, R. Ollerenshaw, F. E. Tylecote, T. B. Mount, J. H. Cobb, A. Young, A. A. S. Skirving, C.M.G., J. Hason, J. McC. Johnston, J. Henderson.

Capt. and temp. Major (acting Lieut.-Col.) T. H. Peyton, D.S.O., reverts to the temporary rank of Major on ceasing to command a Field Ambulance.

Capt. (temp. Major) A. H. Horsfall, D.S.O., relinquishes his temporary rank on alteration in posting.

Captains P. R. Wrigley and D. H. Gore have been restored to the Establishment.

To be Lieutenants: L. Hawkes, W. V. Barritt.

Capt. G. R. Ellis relinquishes his commission on account of ill-health contracted on active service, and is granted the honorary rank of Captain.

Surg.-Gen. W. R. Edwards, C.B., C.M.G., I.M.S., has been appointed an Honorary Physician to the King, vice the late Surg.-Gen. Sir B. Franklin, K.C.I.E.

THE DEVELOPMENT OF TRAINED NURSING IN FRANCE.

BY E. MONTIZAMBERT.

THERE is a fairly widespread idea that since the expulsion of the religious orders there have been in France no properly trained nurses for the sick. The number of women who have adopted the profession of nursing without proper equipment and the unsupervised direction of some of the private registry offices for sick nurses may give some foundation for this opinion.

It is not proposed to deal here with the schools organised by any of the three branches of the French Red Cross. The war has made these Red Cross organisations—especially the efficient school conducted by Mademoiselle Genin at the Hôpital École in the Square des Peupliers—very well known to the general public. There are, however, four or five admirable training schools organised in Paris in the last few years, and their steady and satisfactory growth will inevitably result in the disappearance of tolerated incompetency at an early date. The existence of excellent training schools for civilian hospitals or for private nursing remains almost unsuspected outside of France, and one constantly hears the unfounded statement, "What a pity there are no trained nurses in France!" One reproach most frequently made against the profession of trained nurses in France was that the members were drawn from an ill-educated class. That this was so was partly owing to the fact that nursing the sick was not considered a suitable occupation for well-bred women obliged to earn their living, and partly because of the unorganised and often unsatisfactory conditions under which private nursing was carried on.

Training School of Nurses for Daughters of Gentlemen.

These difficulties were smoothed away by Madame Achille Fould, who, at her own expense and after overcoming many difficulties, founded in 1905 a training school of nurses for the daughters of gentlemen. In one of the poorer quarters of Paris, a site was found where, in addition to buildings already occupied by the charitable activities of the sisters of Saint Vincent de Paul, a hospital for both sexes and excellent quarters for the pupils of the training school were constructed. Everything of hygiene and convenience has been carefully thought out. The details of the operating-rooms, the sterilising plants attached to every ward, and the radiography apparatus are all of the latest device, and every corner of the buildings, as well as every thing they contain, presents the polished cleanliness which marks a new era in French hospital work. An excellent dispensary, airy and spacious, with comfortable oaken benches for the patients and spotless dressing-rooms fitted up with the latest appliances is the scene of part of the hospital work, where the pupils take turns to be on duty. After a probation of three months at the school, the pupils are admitted as candidates for the "Diplôme Supérieur," given at the end of a two years' course of training. In the first year, they receive their theoretical instruction as well as a certain amount of practical work in their own hospital. At the end of this first year, still in their own school hospital, the pupils take courses in the "services" of surgery, ophthalmology, oto-rhino-laryngology, electrotherapy, massage, mechanotherapy, pharmacy. After that come supplementary courses in contagious diseases, maternity, and medical clinics in the different hospitals of the "Assistance Publique." After two months' study in each of the branches of hospital work, the students pass their final examination for the Diplôme Supérieur. The examination consists of a composition on a given theme, a written examination on the lecture notes, and oral questions covering the whole two years' course. The students are very carefully selected with a view to encouraging women of good breeding to take up the private nursing as a profession. Attractive quarters, comprising a bedroom, common sitting-room, and dining-room, are provided for them. During the first year of their training, a fee of £4 a month is supposed to be paid for board, lodging, heating, and laundry, but since the war this rule has been much relaxed. Care has been taken to regulate the conditions under which private nursing is undertaken by the pupils of "La Glacière," as this school is popularly called. A salary of not less than 10 francs a day or night, plus food, laundry and travelling expenses, is exacted, and in no case is the nurse allowed to take her meals with the servants. If there are empty rooms at the school ex-students like to return between their cases. Otherwise they may go to the "Foyer des Infirmières," a *pension* for trained nurses, opened last January at 98, Boulevard Auguste Blanqui. The "Hôpital École" de la Glacière in equipment, organisation, and method of training is worthy of comparison with any of the most up-to-date training schools either in England or America. While a Roman Catholic chapel exists in the grounds, a broad-minded liberality in religious matters gives absolute freedom to the followers of any form of faith. Every graduate does not take up private nursing, but the influence of the "crèche" and other charitable institutions grouped within the walls of what resembles a small village at 35 rue de la Glacière is sometimes seen when a graduate chooses district visiting, dispensary work, or regular hospital work among the poor as her vocation. But these are the exceptions: the majority of the graduates carry out Madame Fould's generous intention of founding, equipping, and defraying the running expenses of a school for professional trained nurses for private cases.

Maison École d'Infirmières Privées.

Another excellent school for trained nurses was organised at 66 rue Vercingétorix by Mademoiselle Chaptal and was recognised by the Government as an "établissement d'utilité publique" in 1911. Mademoiselle Chaptal has studied English institutions and her school is run more or less on English lines. The list of the "Comité de patronage médical" contains 31 of the names of the most brilliant members of the medical profession in France. As the society which directs the "Maison École d'Infirmières Privées" has to cope with different financial conditions from those of "La Glacière," the rules of this school are somewhat different. The regular pupils, at the end of their month's probation, sign a contract for five years with the society. This period includes two years' instruction, after which, on obtaining their diploma, they engage themselves to accept any work given to them by the committee. During these three years 10 per cent. of their salary, as well as a fixed sum of 1 franc a day while they are at work, has to be turned over to the society. The latter undertakes in exchange to obtain work for the graduates. While the principal aim of the school is to train women for private nursing, the graduates are permitted, even during their three years' contract, to accept work in hospitals or clinics. They are allowed to spend their holidays at the Maison École, where the *pension* is fixed at the modest price of 3 francs a day.

The instruction provided is fairly comprehensive. It consists of the probation month, when practical instruction in cooking, housekeeping, &c., and theoretical work in anatomy and physiology is done. Then follows a period of five months' hospital work, when 40 hours per week are spent in the medical wards in addition to the theory lectures given in the Maison École by the hospital staff. After that five months' work is done in the surgical wards, four months in the children's ward, two months of maternity work at the clinic Tarnier, one month at the Pasteur Hospital for Infectious Diseases, and four months in studying special branches such as nervous diseases at the Asile Sainte Anne, eye, ear, throat, and skin, &c. The remainder of the two years' course, which also comprises lectures given at the school in pharmacy, massage, and gymnastics, elementary and professional hygiene, invalid cookery, and a "cours de morale professionnelle," is accounted for by the one month vacation given each year. No examination is made at the end of this two years' course, the "certificat de fin d'études" is signed by the lecturers according to the evidence of the daily notes signed by the doctors under whom the students have worked. Great care is taken in the selection of the students, as Mademoiselle Chaptal's aim has been to raise the standard of trained nursing in France. On the payment of considerably higher fees, students who do not wish to contract a five years' engagement with the society are permitted to receive the same instruction.

Schools for Training District and other Nurses.

The Association pour le Développement de l'Assistance aux Malades, originally founded in 1900 by Madame Alphen-Salvador to encourage district nursing among the poor, at once organised an excellent training school where instruction in all branches of hospital work is given. A preliminary

examination to ensure a certain standard of education on the part of the students is required. There are written and oral examinations at the end of the first and second year, when the rank of "assistant" is obtained. A diploma is only given to those students who, after their two years' course, remain under the direction of the association for three more years. During this time they may be sent out either as private nurses or to fill some post in hospital or district nursing work. Until the war this École Professionnelle at No. 10, rue Amyot, suffered from the drawback of not having a hospital under its own direction, where the students might work under the eye of their instructors. The theoretical work was given at the school, but all the practical work had to be done in one or other of the different hospitals of the "Assistance Publique." This lack has been met last year in the opening of the new hospital school dedicated to the memory of Edith Cavell. The up-to-date hospital, built on a site belonging to the association in the rue Desnouettes, owes its existence to the coöperation of the military authorities, who were faced with the problem of the necessity for hurriedly training the number of amateur nurses whose devotion was not equalled by their knowledge. The military nurses who are sent to the Edith Cavell School are, however, quite apart from the regular students of the school. While they both gain their experience in the same hospital wards, the conditions under which they work are very different. The usual routine of hospital training, with its two years' course, is carried out by the professional students, who have their own class-rooms, &c., quite apart from the nurses who are taking a two months' supplementary course whose incompleteness is acknowledged as inevitable.

While this school is adding to the ranks of efficiently trained nurses every year, its main object still lies in supplying properly trained district nurses primarily for the 5th Arrondissement of Paris. In this work it shares the responsibilities of an organisation called the "Infirmières Visiteuses de France." The wonderful work it is doing for France deserves mention. Founded in February, 1914, and directed by Mdlle. Berthe Milliard, whose name is so well known for her efforts in connexion with the better education of women, this youthful society has already done such excellent work in systematically training nurses for district visiting that it may be regarded as the nucleus of a large body of women who will be able to cope intelligently with the many after-war problems among the poor and the inhabitants of the invaded districts of France. Already 200 fully trained nurses are at work both in Paris and the provinces. The usual course of two years' instruction has been necessarily shortened by the necessities of war-time conditions, but the same care is taken in the recruitment of the students who receive their training at the Laennec Hospital under Dr. Kuss. Special attention is paid to training for tuberculous patients, and the French Government have recognised the excellent work done by these nurses by appealing to them for nurses to staff the military hospitals for men attacked by this disease.

The Training School of the Assistance Publique.

No account of trained nursing in France would be complete without mentioning the splendid new school for training the nursing staff of that immense organisation for caring for the French poor known as the "Assistance Publique." This latest development of modern charity is fittingly installed in the oldest hospital in Paris, La Salpêtrière, which was founded in 1656 as a home for beggars. In the centre of a bewildering maze of buildings, some of which are still devoted to their original uses of asylums for the mentally afflicted, one finds a strikingly new building, opened in 1907, as a training school. Pupils come from all over France, and as the entrance examination is frankly made as simple as possible, the training is open to every class. The students receive free instruction, board, and lodging, and are paid 10 francs a month during their first year and 20 francs a month the following year. They sign a contract to serve for three years in the hospitals of the Assistance Publique at the end of their three years' course, otherwise their *pension* expenses of about £50 a year must be reimbursed.

Every department of the school is most thoroughly up to date, careful provision has been made for the comfort of the nurses, and the immense scale on which hospital work is carried on ensures the benefit of a wide experience for them.

The aim of this vast establishment is solely to supply the needs of its own organisations, but while many of the pupils are content to devote their lives to hospital work with the assurance of a State pension when the age-limit is reached, many of them ultimately take up private nursing after their five years' engagement is finished and are able to give to their patients the skill and knowledge they have gained under the direction of the most brilliant specialists in France.

Unhygienic conditions in certain hospitals may still exist, but a new era in nursing has begun, and the skill and science of the properly trained French nurse are second to none.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An ordinary meeting of the Council was held on June 14th, Sir W. Watson Cheyne, the President, being in the chair.—A report was read from the Board of Examiners in Anatomy and Physiology for the Fellowship, stating that at the recent examination 30 candidates were examined, and that of these 12 passed and 18 failed.—A report was read from the Court of Examiners stating that at the recent Final Fellowship Examination 12 candidates presented themselves, of whom 3 were approved and 9 were rejected. The Diploma of Fellow was accordingly conferred upon the following gentlemen who have complied with the necessary by-laws:—

Alberto Medardo Zumora, M.B. Cantab., M.R.C.S., L.R.C.P., Guy's Hospital; Lyle John Cameron, M.D. Manitoba, M.R.C.S., L.R.C.P., Manitoba University, London and Charing Cross Hospitals; and John Dudgeon Oliver, M.B. Dub., M.R.C.S., L.R.C.P., Dublin, and Middlesex Hospital.

Diplomas of Member were conferred upon the following two candidates who have complied with the necessary by-laws:—

Edward Thomas Holdge, M.B. Toronto, Toronto University and Middlesex Hospital; Eleanor Joyce Partridge, Royal Free Hospital.

Licences in Dental Surgery were also conferred upon 16 candidates who have passed the requisite examinations and have complied with the by-laws of the College. The following are the names and schools of the successful candidates:—

Hubert John Vere Raywood Allin, Birm'ngham University; Theodore Boques Barton, Guy's; Albert William Ewart Chapple, Manchester University; Reginald George Joseph Charlesworth, Middlesex and Royal Dental; Leslie Douglas Crabb, Guy's; Morgan James Evans, Birmingham University; George Frederick Faustmann and Frederick George Pritchard Flanders, Guy's; Sidney Francis Greenfield, Middlesex and National Dental; Wallace Inman, Middlesex and Royal Dental; Harold John Powell, Guy's; William John Ross, Liverpool University; Willem Gerrit Ryss, Middlesex and Royal Dental; Robert William Spong, Guy's; Sidney Stamp, Middlesex and Royal Dental; and Sydney Granville Townley, Guy's.

The Secretary reported the death of Mr. W. B. Kebble, clerk in the secretary's office, who had been in the service of the College since 1884.

The Council elected the following examiners. Examiners in Anatomy and Physiology for the Fellowship:—Anatomy: R. W. Reid, Gordon Taylor, William Wright, and W. H. Clayton Greene. Physiology: G. A. Buckmaster, J. B. Leathes, H. W. Lyle, and F. A. Bainbridge. The Examining Board in England: Elementary Biology: W. G. Ridewood and G. P. Mudge. Anatomy: J. E. S. Frazer, Arthur Thomson, and F. Wood Jones. Physiology: C. M. Hinds Howell and G. A. Buckmaster. Midwifery: H. Russell Andrews, C. H. Roberts, J. S. Fairbairn, and G. F. Darwall Smith. Public Health, Part I.: J. W. H. Eyre; Part II.: F. N. K. Menzies. Tropical Medicine and Hygiene:—Bacteriology: J. W. H. Eyre. Diseases of Tropics: C. W. Daniels.

A letter was read from Mr. H. J. Waring reporting the proceedings of the General Medical Council at their recent session, when the thanks of the Council were given to Mr. Waring for his services as the representative of the College.—The President reported that he had nominated Mr. Bilton Pollard to serve on a tribunal which has been set up by the Ministry of Pensions for the consideration of appeals by discharged disabled sailors and soldiers with reference to the grant of gratuities in place of pensions.—The President reported that a meeting of Fellows would be held on July 5th next for the election of three Fellows into the Council in the vacancies occasioned by the retirement in rotation of Mr. W. Harrison Cripps and Mr. C. Warren Low, C.B., and by the death of Sir Frederic Eve, and that the list of candidates was as follows: Mr. Cripps, Mr. Low, Mr. H. B. Robinson, Mr. H. B. Grimsdale, Mr. F. J. Steward, Mr. James Sherren, and Mr. P. W. Bassett-Smith.—The President reported that the terms of office as examiners for the College of Mr. L. A. Dunn and Mr. W. H. Dolamore would expire on July 25th, and that the vacancies would be filled at the ordinary meeting of the Council on July 26th.

ROYAL MEDICAL BENEVOLENT FUND.—The following are the details of cases of special distress caused by the war which the committee have helped from the War Emergency Fund:—

Lieutenant in the R.A.M.C. who had only been in practice a few years, volunteered for service and was killed in action a few days later. He left a widow with two children, aged 3½ years and 1 year, without means except the War Office pension. The Fund voted £25 for immediate necessities, and the Officers' Families Fund gave further help.—Captain in the Territorials was called out and had to leave his practice in the hands of a locum, who proved a failure. There were seven children, aged 2-14. Financial difficulties arose, and payment of the school fees became impossible. Between the Fund and Guild and the Officers' Families Fund the necessary fees were raised and sorely needed clothing provided.—Captain in the Territorials who was called out when the Army mobilised and had to leave his practice, worth £800, at a day's notice. Could not pay the fees for his son's education, who was in his last year at school. The Fund, the Guild, and the Professional Classes War Relief Council together raised the necessary money.—Captain in the Territorials was killed in action and left a widow and two children, aged 3 and 4½ years. The Fund investigated the case and referred it to the Officers' Families Fund, who granted a sum of money to meet immediate necessities. The Fund also obtained work for the widow, a trained nurse, who was thus enabled to earn her own living.—Major R.A.M.C., Territorial, was called out at the beginning of the war, and was abroad for over two years. He was invalided to England and put on home service. His practice was completely lost by his absence. There are three children, one in the Navy, one in the Army, and one at school. He had to give up his house, as he was in difficulties with rent, taxes, and education. The Fund gave £50, and further help was obtained from other sources.—Captain in the R.A.M.C. (T.), with a wife and six children; found the income derived from his practice, left in the charge of a locum, and the balance of his Army pay insufficient to meet his minimum expenses. He obtained assistance from the Civil Liabilities Committee and the Officers' Families Fund, and a grant was made from the War Emergency Fund towards the education of the children.—Practitioner, earning £700 to £800, volunteered for service, leaving his practice in the hands of a neighbour, who was not a success. There were two children, aged 7 and 10, and another baby was born shortly after the husband left. The wife contracted pneumonia and nearly died. A resident patient had to leave the house. Rent and other expenses led to a debt of about £80. This the doctor could not meet, and he hurried back from the trenches to save his home from being sold up. The Fund voted £25, the Guild gave £15, the Officers' Families Fund £25, and the Professional Classes War Relief Council offered further help, with the result that he returned to the Front with his immediate anxieties relieved.

Subscriptions may be sent to the acting honorary treasurer, Dr. Samuel West, at 11, Chandos-street, Cavendish-square, London, W. 1.

THE address of the National Council for Combating Venereal Diseases is now Avenue Chambers, Southampton-row, London, W.C. 1.

CONFERENCES ON VENEREAL DISEASES.—The second annual meeting of the National Council for Combating Venereal Diseases was held at the Queen's Hall, London, on June 13th, Lord Sydenham presiding. The latest information was given by Lord Rhondda regarding the council schemes for diagnosis and treatment. Out of a possible 145, schemes had been submitted by 102 councils (representing a population of 26 out of the total 36 millions), and of these 68 had been approved. In 52 hospitals, dealing with a population of 16 millions, work had already commenced in the treatment centres. Up to the end of May 6000 new cases were treated in the London clinics alone, and the centre at the Albert Dock Hospital was doing specially useful work in arresting cases of venereal diseases imported from abroad.—A conference took place at the beginning of the month under the auspices of the Public Health Committee of Edinburgh Town Council. Sir Malcolm Morris, chairman of the Propaganda Committee of the National Council, dealt in an exhaustive way with the legislation which enabled communities to deal with the diseases. The Edinburgh corporation are preparing a scheme in accordance.

SOCIETY FOR THE STUDY OF INEBRIETY.—The next meeting of this society will be held in the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., on Tuesday, July 10th, at 4 P.M., when Dr. Stanley Kent, professor of physiology in the University of Bristol, will open a discussion on "Fatigue and Alcohol."

ROYAL VICTORIA HOSPITAL, BELFAST.—A committee of business men who have investigated the finances of the Royal Victoria Hospital, Belfast, have published a table contrasting the hospital with similar institutions in the United Kingdom, and from their figures it appears that in 1916 the cost per bed in the Royal Victoria Hospital was £80, which was only surpassed in smallness of amount by the Aberdeen Hospital (where it was £70), by the Hospital in Dundee (where it was £71), and by the Royal Infirmary, Edinburgh (where it was £76). The highest cost per bed was at the London Hospital, where for 1916 it was £143. In Birmingham it was £107, in Leicester £103, and in Cardiff £102. In the Royal Victoria Hospital the average beds occupied in 1916 were 277·6, instead of 266·8 in 1915, and the expenditure was £10 per bed higher.

RED CROSS GIFTS.—£100,000, the first instalment of the amount raised in Victoria in response to the appeal made by Lady Stanley, wife of the Governor, are being remitted to London for the British Red Cross.

Sir E. Cooper Perry has been elected Vice-Chancellor of the University of London for the ensuing year, as successor to Sir Alfred Pearce Gould.

ROYAL MEDICAL BENEVOLENT FUND OF IRELAND.—The annual meeting of the Royal Medical Benevolent Fund was held on June 14th at the Royal College of Physicians, Dr. J. F. O'Carroll, President of the College, presiding. The annual report stated that the number of applicants during the year had been large, and the amount recommended to be given in grants was greater than usual. The total amount of grants was £1239. The branch subscriptions showed a substantial improvement. Donations and bequests fell short by only £24. The income was £1629, showing a gratifying increase of £362.

SOUTH LONDON HOSPITAL FOR WOMEN.—The fifth annual report of this hospital, dealing with the year 1916, refers to the new buildings for in-patients opened in July last by the Queen, who has become patron of the hospital. In the October following two wards were available for patients, and by December 66 in-patients had been provided for. It is hoped that the remaining 14 beds will be ready as soon as the necessary nursing staff can be obtained. At a meeting recently held on behalf of the hospital Sir Alfred Keogh, Director-General of the Army Medical Service, said that the Local Government Board had recognised it as a treatment centre for venereal diseases, and he looked to the hospital to render great public service in the venereal campaign. Lady Londonderry said the accommodation of the hospital was far less than was needed both in the matter of beds and the treatment of out-patients. An increased nursing staff was a pressing need.

DONATIONS AND BEQUESTS.—By the will of the late Lieutenant-Colonel Sir John Howard, of Brighton, the testator has left £40,000 in trust to establish a "John Howard" Hospital, primarily for surgical cases, and for the use of patients able and willing to pay reasonable and ordinary fees, or to assist any existing hospital, or for other hospital purposes in Brighton; £33,000 and the land on which it is built for the "John Howard" Convalescent Home and for the erection of 24 cottages for the use and lodging of trained hospital nurses whose health has broken down, and for the payment of 10s. a week to each of the inmates; and £600 a year for 21 years for the "Howard Charity" for the relief of distressed widows and aged and sick poor of Brighton; £300 to the Sussex County Hospital; and £200 to St. Bernard's Home for Invalid Gentlewomen.—The late Mr. Arthur Edward Seawell, of Farnham, has left by will £300 to the Alton Cottage Hospital and £200 to the London Hospital.—Under the will of the late Mr. Henry William Ransom, of Folkestone, the Victoria Hospital, Folkestone, will receive £1000.

URBAN VITAL STATISTICS.

(Week ended June 16th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 12·8, against 12·7 per 1000 in each of the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 12·3, or 0·2 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 3·7 in Grimsby, 4·7 in Wimbledon, and 5·2 in Swindon, to 20·9 in Hastings, 21·2 in Middlesbrough, and 26·2 in South Shields. The principal epidemic diseases caused 317 deaths, which corresponded to an annual rate of 1·0 per 1000, and included 195 from measles, 46 from infantile diarrhœa, 35 from whooping-cough, 28 from diphtheria, 10 from enteric fever, and 3 from scarlet fever. The deaths from measles were 13 below the number in the previous week, and caused the highest annual death-rates of 2·9 in Sunderland, 3·1 in West Bromwich, 4·1 in Walsall and in Rotherham, and 5·9 in Middlesbrough. The 601 cases of scarlet fever and 1089 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 35 below and 7 above the numbers remaining at the end of the previous week. Of the 4160 deaths from all causes in the 96 towns, 141 resulted from violence. The causes of 32 deaths were uncertified, of which 5 were registered in Birmingham and 5 in Liverpool.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 14·7, against rates declining from 17·0 to 14·9 per 1000 in the four preceding weeks. The 335 deaths in Glasgow corresponded to an annual rate of 15·7 per 1000, and included 31 from measles, 29 from whooping-cough, and 1 each from diphtheria and infantile diarrhœa. The 85 deaths in Edinburgh were equal to an annual rate of 13·4 per 1000, and included 10 from measles, 6 from whooping cough, and 1 from scarlet fever.

Irish Towns.—The 136 deaths in Dublin corresponded to a rate of 17·8 per 1000, and included 3 from measles and 2 from infantile diarrhœa. The 117 deaths in Belfast were equal to a rate of 15·5 per 1000, and included 3 from infantile diarrhœa and 1 each from enteric fever, measles, and diphtheria.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Report of Mesopotamia Commission.

THE report of the Commission of Inquiry into Military Operations in Mesopotamia has been laid on the table of the House of Commons.

Chemistry at Edinburgh University.

An ordinance of the Edinburgh University Court respecting the foundation of a chair of Chemistry in relation to medicine has been presented to Parliament.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 13TH.

Treatment of Shell Shock.

Colonel YATE asked the Under Secretary for War whether permission could now be given for soldiers suffering from shell shock and other convalescents in hospitals and command depôts who were fit for light work to employ their leisure time, when they wished to do so, in agriculture, gardening, and the cultivation of any land there might be in the neighbourhood, so as to afford the men some relief from the monotony of their existence and give them an interest in life.—Mr. MACPHERSON replied: Soldiers in command depôts are already employed in the cultivation of land in and about the depôts. Arrangements have been made and are being extended by which men in hospital suffering from shell shock are employed on agricultural work as soon as they are fit for it. As regards other convalescents, the first concern of the Army authorities is to get men fit again as quickly as possible to resume military duty.

THURSDAY, JUNE 14TH.

Repatriation of Incapacitated Prisoners.

Mr. J. F. HOPE (representing the War Prisoners Department) informed Mr. MACMASTER that the Government had heard from the French Government that an extended agreement for the repatriation of French and German incapacitated combatant prisoners had been in force for a week, but he did not yet know the details. The only agreement in force between H.M. Government and the German Government for the repatriation of combatant prisoners of war was in respect of those who were totally incapacitated from further military service. It should be understood that this reply applied only to exchange of prisoners and not to internment in neutral countries.

Pensions for Officers and Nurses.

Replying to Sir H. CRAIK, Mr. BARNES (Pensions Minister) regretted that the new Warrant in regard to the pensions of officers and nurses had been delayed, but he thought that a satisfactory settlement was now in sight, and he hoped to lay the document before the House within the next fortnight. The beneficiaries would suffer no disadvantage, as payment under the new scales would operate as from April 1st.

Medical Re-examinations.

Answering Sir M. LEVY, Mr. MACPHERSON (Under Secretary for War) wrote: I am aware that attempts are being made to stir up dissatisfaction with the administration of the Military Service (Review of Exceptions) Act. There have been cases in which reasonable grounds for dissatisfaction have been present. In practically every case these grounds have been removed before any public comment arose. The whole administration is being, and will continue to be, most carefully watched, and throughout the country Medical Boards are working with great care. I am not aware that any man totally unfit for military service is being accepted for active service. If my honourable friend will supply me with details of the cases he has in mind they will be fully inquired into. Copies of all printed instructions issued in connexion with the Review of Exceptions Act are in the library of the House of Commons. No secret or oral instructions have been issued by the Army Council. With reference to alleged cases of disagreement between the classification shown on a man's medical history sheet and on his classification card, I have no knowledge. The proceeding is to attach to the medical history sheet a counterfoil of the classification card. This counterfoil is made out at the same time as the classification card received by the man. It, therefore, is unlikely that mistakes are made. If the honourable Member knows of any specific instance full inquiries will be made. The instructions dealing with this matter are in the library of the House. Figures as to the percentage of men rejected as totally unfit who on re-examination have been classified in categories A, B, and C are not yet available for the whole country, but in some localities the pe centage of A category men has been low. In one district notorious for fraudulent rejection in the past the percentage has been as high as 25 on the examinations conducted up to June 1st. All the suspected cases were called first in that area, and the result has been fully to substantiate the worst fears of the authorities. The boards conducting those examinations were composed entirely of civilian medical men with Territorial or temporarily commissioned or retired presidents. They have been specially inspected by inspectors from the War Office and their work has been reported as a model of careful examination.

R.A.M.C. Officers Training Centre.

Mr. MORRELL asked the Under Secretary for War whether he was aware that a large number of qualified surgeons and medical practitioners were undergoing a course of military training at Blackpool; whether many of these men had for weeks past been engaged all day on the usual infantry drill without the opportunity of doing any medical or surgical work of any kind whatever, although in many cases they were highly skilled men and had given up large practices in order to serve in the Army; whether a similar state of things existed in other training centres; and whether, in view of the need for doctors and surgeons at the front, he would take any steps in the matter.—Mr. MACPHERSON answered: Medical men are sent to Blackpool training centre for a short course of instruction, on the completion of which they are despatched to the forces abroad. All the officers other than the permanent staff of those temporarily unfit for service abroad are waiting opportunities for shipment. There is no other training centre for Royal Army Medical Corps officers.

Promotions of R.A.M.C. Officers.

Captain WRIGHT asked the Under Secretary for War whether Territorial officers of the Royal Army Medical Corps had recently been sent out to France in charge of branch Territorial hospitals with the rank of temporary major who were not Territorial officers before the war, or were not on the staff of a recognised Territorial hospital, and therefore not *à-la-suite* officers, whilst officers who were serving before the war, who had been mobilised since August, 1914, at the front since February, 1915, and in some cases officers commanding surgical division at general hospitals were held not to be eligible for promotion above the rank of captain; and why doctors who until recently had remained in the enjoyment of their practices in England were given advantages of promotion and pay over officers who had been voluntarily serving in His Majesty's Forces for years before, and continuously since, the beginning of the war.—Mr. MACPHERSON answered: I am not clear to which hospitals my honourable and gallant friend refers. If he has in mind the special Territorial general hospitals which were recently sent overseas, the senior officers were specially selected from the Territorial Force general hospitals in each command which furnished a hospital. These officers by a special arrangement were to serve for a minimum period of three months, and be relieved when necessary by other officers on the staff of the parent hospital. Appropriate acting rank was given to officers occupying positions where such promotion was considered desirable. The question of appointing field officers to the charge of the medical and surgical division of all general hospitals is under consideration.

Mr. MACVEAGH asked the honourable gentleman what principles, or basis of principles, now obtained for the selection of officers in the Royal Army Medical Corps for promotion in rank; whether the same principles for purposes of promotion held in the case of Royal Army Medical Corps officers in the Regular Force, the Territorial Force, and the temporary commissioned officers; whether any differences in the system of promotion existed in the different branches of the Royal Army Medical Corps; whether his attention had been called to certain recent promotions in the Territorial Force to the rank of major in the Royal Army Medical Corps; whether all or most of the officers so promoted had till quite recently been serving at home; whether he was aware that such promotion over the heads of other officers, some senior in previous and present service, in the same and other branches of the Royal Army Medical Corps who had had considerable overseas service was prejudicial to the interests of the medical service and was likely to increase the sense of injustice as to the irregularity of promotions, and that injustice had been done in some instances; and whether such promotions came within the purview of the recently appointed Army Promotions Board.—Mr. MACPHERSON wrote in reply: Promotions in the Royal Army Medical Corps, Regular, Special Service, and Territorial Force, up to the rank of major are governed by a qualifying time period of service for each step in rank. Promotions above the rank of major are by seniority and selection. In the case of a temporary commissioned officer promotion to captain is given after 12 months' service and promotions to higher rank are given in individual cases as suitable vacancies arise according to the officer's qualifications and

the nature of the appointment for which such promotion is considered necessary. No differences other than those enumerated exist in the system of promotion in the different branches of the Royal Army Medical Corps. If my honourable friend is referring in the latter part of the question to promotions made in the Special Territorial Force general hospitals, which were recently sent to France under special conditions to meet emergency, the promotions made in these units are all temporary and are not considered as prejudicial to the interests of the medical service or as causing injustice to other officers. The whole question of promotion generally in the Royal Army Medical Corps Territorial Force comes within the purview of the committee presided over by the Member for Dundee (Mr. Churchill).

Sir E. GOULDING asked when the report of the committee which had considered and reported on the question of promotion in regard to the General Reserve of Officers, the Special Reserve of Officers, and of the Territorial Force would be laid upon the table.—Mr. MACPHERSON replied: The recommendations of this committee are being sympathetically considered, and as soon as final decisions have been reached in regard to them the report will be presented to both Houses together with a note of the decisions. I trust this will be done very shortly.

Medical Students and Military Service.

Mr. DILLON asked the Under Secretary for War whether, in view of the increasing demands by the War Office on the medical profession and the great number of casualties amongst doctors in the field, the War Office would exempt all medical students of one year's standing and upwards from liability to be called up under the Military Service Acts.—Mr. MACPHERSON wrote in reply: The Army Council has been in close touch with the medical authorities, and the need for providing for future needs of the medical profession has been given full weight. Under present arrangements a large measure of protection is given to medical students. None of those who are within 24 months of qualification are called up for service, while of those in the earlier years only men fit for general service or classified B 1 are called up. In view of the present need of men of those categories for combatant service it is not considered that in the national interest any alteration of the present arrangement should be made.

MONDAY, JUNE 18TH.

The Case of Dr. J. C. M'Callum.

Mr. T. E. HARVEY asked the Home Secretary whether Dr. J. C. M'Callum, a graduate of Edinburgh University, medallist and holder of the Mouat scholarship, executive tuberculosis officer for the county of Argyll, holding the diploma of public health, and having specialised in the treatment of tuberculosis, had been employed by the Home Office Committee on Employment of Conscientious Objectors, first at Wakefield and then as a labourer in the manufacture of manure for Messrs. Rough and Sons, Broxburn, Edinburgh; whether, in consequence of a breach of workshop discipline, this employment had been terminated; and whether, in the national interest, he would consider the possibility of employing this specialist on public health work under whatever financial conditions the committee's regulations imposed instead of on work for which he was not fitted or instead of sending him back to court-martial and prison.—Sir G. CAVE replied: John M'Callum has been employed as stated. His employment has been terminated, not for one but for several breaches of discipline. The Committee on the Employment of Conscientious Objectors have recommended his recall to the Army, and the case is now out of their hands. I understand that Dr. M'Callum has never applied to the Committee to be released in order to take up employment as a doctor, but he and members of his family have made applications for him to be allowed to do ploughing and similar work for relatives.

Mr. HARVEY: Will the right honourable gentleman consider that this Committee should employ doctors for medical work in view of the great need for doctors in this country?—Sir G. CAVE: If applications were made for their services no doubt they would be considered.

American Medical Men.

Replying to Sir G. GREENWOOD, Mr. MACPHERSON (Under Secretary for War) said: We only propose to accept the services of American doctors sent to us by responsible authorities in the United States.

Surgical Aid in Air Raids.

Mr. BROOKES asked the Home Secretary whether, on the occasion of the recent air raid, one of the leading hospitals had to request the services of an entire Army Medical Board; and whether arrangements existed for ensuring prompt and adequate surgical aid in all cases.—Sir G. CAVE wrote in reply: Arrangements are made by the police for securing the services of doctors and ambulances and making other provisions for rendering first aid. I understand that on Wednesday last, owing to the short time which elapsed between the receipt of warning by the police and the occurrence of the raid, medical aid was urgently required, and the services of the members of an Army Medical Board were requisitioned.

TUESDAY, JUNE 19TH.

A Ministry of Health.

Sir W. COLLINS asked the Chancellor of the Exchequer whether any decision had been arrived at by the Government as to the establishment of a Ministry of Health.—Mr. BONAR LAW replied: I am not yet in a position to make any statement.

Sir W. COLLINS: Are we to understand that the statement published yesterday on the authority of the President of the Local Government Board to the effect that a Ministry of Health is about to be established is incorrect?—Mr. BONAR LAW: I have not noticed that. I know that my noble friend has been working on the subject, but the Government has come to no decision, and it is not possible to introduce legislation this session.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

BOYCE, C. R., F.R.C.S. Irel., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Enniscorthy District of the County of Wexford.

LUCAS, C. B., L.R.C.P. & S. Edin., L.F.P.S.G., Certifying Surgeon under the Factory and Workshop Acts for the Fovers District of the County of Invernesa.

WOOD-SMITH, ALGERNON, M.D., F.R.F.P.S.G., School Medical Inspector to the County of Stirling.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BELGRAVE HOSPITAL FOR CHILDREN, Clapham-road, S.W.—Resident Medical Officer for six months. Salary at rate of £75 per annum, with board, &c.

BIRMINGHAM.—Female Locum Tenens for Infant Consultation Work for three months. Salary 8 guineas per week.

BODMIN, CORNWALL COUNTY ASYLUM.—Female Junior Assistant Medical Officer. Salary £200 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

CARDIFF, KING EDWARD VII.'S HOSPITAL.—House Surgeon for six months. Salary at rate of £200 per annum, with board, &c.

CHELSEA HOSPITAL FOR WOMEN, Arthur-street, Chelsea, S.W.—Resident House Surgeon and Registrar for 12 months. Salary £150 per annum.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

DONNYBROOK, DUBLIN, ROYAL HOSPITAL FOR INCURABLES.—Resident Medical Officer, unmarried. Salary £200 per annum, with board, &c.

EAST LONDON HOSPITAL FOR CHILDREN, Shadwell, E.—Assistant Resident Medical Officer. Salary £125 per annum, with board, &c.

ENFIELD, ROYAL SMALL ARMS FACTORY.—Assistant Medical Officer. Salary £438 per annum.

EVELINA HOSPITAL FOR CHILDREN, Southwark, S.E.—House Physician. Salary at rate of £160 per annum, with board, &c. Also Clinical Assistants in Out-patient Departments.

GENERAL LYING-IN HOSPITAL, York-road, S.E.—Resident Medical Officer for three months. Salary £100 per annum, with board.

GLOUCESTERSHIRE ROYAL INFIRMARY AND EYE INSTITUTION.—Assistant House Surgeon. Salary £150 per annum, with board, &c.

GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—House Surgeon. Salary £250 per annum, with board, &c.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill.—Resident House Physician for six months. Salary at rate of £200 per annum.

LEEDS GENERAL INFIRMARY.—Resident Aural Officer. Salary £100 per annum, with board, &c.

LEICESTERSHIRE EDUCATION COMMITTEE.—Temporary Assistant School Medical Officers. Salary at rate of £350 per annum.

MANCHESTER AND SALFORD LOCK HOSPITAL.—Temporary Part-time Medical Officer. Salary £300 per annum.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, near Manchester.—Two Female Resident Medical Officers, unmarried. Salary at rate of £200 per annum.

MANCHESTER COUNTY ASYLUM, Prestwich.—Locum Tenens. Salary £7 7s. per week, with board, &c.

NOTTINGHAM GENERAL HOSPITAL.—Holiday Locum Tenens, Female. Salary at rate of £250 per annum, with board, &c.

OLDHAM ROYAL INFIRMARY.—Third House Surgeon. Salary £225 per annum, with board, &c.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL.—House Physician. Salary £200 per annum, with board, &c.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—Assistant Resident Medical Officer for four months. Salary at rate of £60 per annum, with board, &c. Also District Resident Medical Officer for four months. Salary at rate of £60 per annum, with board, &c.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician for six months. Salary £100 per annum, with board, &c.

ROTHERHAM HOSPITAL.—Junior House Surgeon. Salary £150 per annum, with board, &c.
ROYAL LONDON OPHTHALMIC HOSPITAL, City-road, E.C.—Third House Surgeon. Salary at rate of £50 per annum, with board, &c.
SALFORD ROYAL HOSPITAL.—Junior House Surgeon. Salary at rate of £150 per annum, with board, &c.
SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.
SHEFFIELD UNION HOSPITAL, Firvale.—Female Resident Assistant Medical Officer. Salary £250 per annum, with rations, &c.
SHREWSBURY, ROYAL SALOP INFIRMARY.—House Physician. Salary at rate of £200 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Raunds, Northampton; Rosscarbery, Cork; and Tattenhall, Chester.

Births, Marriages, and Deaths.

BIRTHS.

BASHFORD.—On June 18th, at Downshire-hill, Hampstead, the wife of H. H. Bashford, M.D., of a daughter.
EDRIDGE.—On June 10th, to Dr. and Mrs. Ray Edridge, of Lynvale, St. Mark's-place, Bath, of a son.
HILL.—On June 18th, at Armaside, Purley, the wife of Lieutenant R. Gordon Hill, R.A.M.C., of a daughter.
HUGHES.—On June 9th, at Tudor House, High Barnet, the wife of Lieutenant G. R. Hughes, R.A.M.C., of a daughter.
MELLAND.—On June 13th, at Ladybarn-road, Fallowfield, Manchester, the wife of Dr. Charles H. Melland, Captain, R.A.M.C.(T.F.), of a daughter.
MUSGRAVE WOODMAN.—On June 10th, at Newhall street, Birmingham, the wife of Captain B. Musgrave Woodman, R.A.M.C., of a son.
STADDON.—On June 13th, at King's-road, Kingston-on-Thames, the wife of Captain Eric J. Staddon, R.A.M.C., of a son.

MARRIAGES.

HOBBS—CARGILL.—On Tuesday, June 12th, at St. Saviour's, Warwick-avenue, W., Surgeon Roland A. Hobbs, R.N., to Marjorie, elder daughter of Mr. Justice and Mrs. Cargill, of Kingston, Jamaica.
MCLEAY—PEIRS.—On June 18th, at the Parish Church, Carshalton, Charles Wm. McLeay, M.D., W.A.M.S., to Olive, youngest daughter of Hugh Vaughan Peirs.

DEATHS.

FRERE.—Killed in action, "while attending the wounded near the front line," on June 9th, his 27th birthday, Captain Frederick John Henry Tob'as (Eric) Frere, M.C., M.B., R.A.M.C., attached Lincoln Regiment.
HAIRSINE.—Killed in action, on June 9th, Captain Owen Hairsine, M.C., R.A.M.C., aged 26.
WALTERS.—On June 11th, at More Cottage, Reigate, John Walters, M.B., J.P., in his 81st year.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN, London.
The Choice Before Us. By G. Lowes Dickinson. 6s. net.

BAILLIÈRE, TINDALL, AND COX, London.
Anatomy and Physiology of the Female Body. By H. E. J. Biss, M.D., D.P.H. Third edition. Plates by G. M. Dupuy, M.D. 4s. net.
Treatment of Infected Wounds. By A. Carrel and G. Dehelly. Translated by Herbert Child, formerly Surgeon, French Red Cross. With Introduction by Sir Anthony A. Bowlby, K.C.M.G., K.C.V.O., Surgeon-General, A.M.S. 5s. net.
Treatment of Tuberculosis by Means of Spengler's Immune Bodies (I.K. Therapy). By Niven Robertson, M.D. Edin., D.P.H. Cantab. 5s. net.

CHURCHILL, J. AND A., London.
Microbiology: A Text-book of Microörganisms, General and Applied. Edited by C. E. Marshall, Professor of Microbiology, Massachusetts Agriculture College. Second edition. 12s. 6d. net.

FROWDE, HENRY, AND HODDER AND STOUGHTON, London.
Dream Psychology. By M. Nicoll, Temporary Captain, R.A.M.C. 6s. net.

HEINEMANN, WM., London.
Manual of Practical X Ray Work. By David Arthur, M.D., D.P.H., and John Muir, B.Sc., M.B., Captain, R.A.M.C.T. Second and revised edition. 12s. 6d. net.

KIMPTON, HENRY, London.
Clinical Tuberculosis. By Francis Marion Pottenger, A.M., M.D., LL.D. With Chapter on Clinical Methods, by J. E. Pottenger, A.B., M.D. Vol. I., Pathology, Anatomy, &c. Vol. II., Complications and Treatment.

LEWIS, H. K., AND CO., London.
Congenital Word-Blindness. By James Hinshelwood, M.A., M.D., F.R.F.P.S. Glasg. 4s. net.
Dangers in Neck-Wear. By Walter G. Walford, M.D. 4s. 6d. net.

WRIGHT, JOHN, Bristol.
Medical Annual, 1917. 10s. net.

YALE UNIVERSITY PRESS, New Haven, Conn., and New York City.
Growth of Medicine from Earliest Times to 1800. By Albert H. Buck, B.A., M.D. $5 net.

Notes, Short Comments, and Answers to Correspondents.

THE DISPOSAL OF THE DEAD.

THE manner of burial or disposal of the dead human body is a subject of perennial interest to the public at large, to each individual, and to the sanitary authorities. The Burial Act of 1855 enacts that no burial shall take place within 100 yards of a dwelling-house, and this decision is undoubtedly for sanitary reasons. It is necessarily affected by the kind of coffin in which the body is buried. Economy in burials, as in other things affecting private affairs, is now the order of the day. The cost of funerals and coffins has often been entirely out of proportion to the status of the deceased and absorbing most of the insurance money. Transporting bodies long distances is often a matter of sentiment and must to-day be discouraged.

Apart from ordinary coffins, there have been the simple winding-sheet or shroud, a blanket, papier maché, bark, the hollowed trunk of a tree, or a wicker basket with charcoal. Limestone, other kinds of stone, marble, and iron have all been used for coffins, and there is a beautiful alabaster sarcophagus of Seti, father of Rameses II., amongst the art treasures in Sir John Soane's Museum in Lincoln's Inn Fields. The coffin as a work of art has frequently appealed to oriental nations, who have often had them made perhaps years before death, a practice not unknown in European countries. Some old coffins were superbly enamelled and jewelled with fragments of precious stones and gilded with real gold. Sir Erasmus Wilson said that sometimes copper was fraudulently used instead of gold by the ancient Egyptian artists. Some years ago there was an attempt to introduce general burial of the body by pouring lime in the wooden coffin just before interment, but the idea did not recommend itself to æsthetic tastes or religious sentiment. As compromises wicker coffins or alternately coffins with thin glass lids, so that the weight of the earth should quickly smash in the lid and expedite the dissolution of the body, were recommended. The majority of people in this country, however, still adhere to lead, oak, and elm coffins with brass handles and nameplate. In the United States the glass lid coffin seems to be growing in vogue, although there a coffin is usually called a "casket." The casket may be made of bronze, cast metal, or steel, and claims to protect the bodies "from the hideous violations of the earth."

The disposal of the bodies of certain of the American Presidents forms an example which hygienists will regret. There is at Canton, Ohio, a McKinley monument, and in this tomb lie the remains of President McKinley and his wife in Springfield metallic caskets of bronze. These caskets were patented in the United States in 1898, and are claimed to be "the most perfect burial receptacle known." The adherents of burial reform who advocate that dissolution should take place as rapidly as possible and that no built graves should be used will hardly be likely to agree to this claim. President Garfield was buried in a bronze casket in 1881, and President Grant, who died in 1885, was buried in a casket of Bessemer steel with oval top, secured by rivets put in red hot. It is 8 feet long, 3 feet 6 inches high, and 35 inches wide, painted with waterproof paint, and stained mahogany colour. Its gross weight is 3800 lb. It has silver mountings and a gold plate engraved with his name, "U. S. Grant." It is claimed to be burglar-, air- and fire-proof. President Lincoln was first buried in a red cedar coffin, but an attempt was made to steal the body and it is now covered by a huge monument. The large number of men killed in the present war has caused a reversion to primitive methods of burial—nature's barrows and tumuli or crevasses which call for no coffins.

INDIAN AMBULANCE MANUALS.

FROM Messrs. Vithal Asharam Thakkar, Shiyapura-Baroda, we have received a copy of "Prathmic Madad Karanaraone Shikshan," a translation of Colonel R. J. Blackham's little book on Indian ambulance training, which has been made in Gujerati by Dr. Dhanjibhai Hormasji Mehta, lecturer and examiner to the St. John Ambulance Association, and jail superintendent at Baroda. The price is 1 rupee. The author, who has done his work in a very careful and painstaking manner, is an enthusiastic ambulance worker, and has translated for the use of Hindoos and others several ambulance and first-aid books, including "Tropical Hygiene," by Sir Pardey Lukis and Colonel Blackham. The translation of "Indian Ambulance Training" should prove useful to ambulance centres in Gujerati and Kathiawar, especially in the formation of classes for instruction in

receiving the wounded from the Front. Messrs. Claridge and Co., Caxton House, Bombay, publish the original edition of "Indian Ambulance Training" in English, price 12 annas. This firm has also recently issued new editions of other ambulance books by Colonel Blackham—namely, "The Indian Manual of First Aid," fifteenth edition, price 1 rupee, and "A Primer of Tropical Hygiene," third edition, price 12 annas.

BANTING AND *PUNCH*.

THE aurist of distinction who first gave William Banting the hints as to diet which reduced his weight by two and a half stone[1] was Mr. William Harvey, of Soho-square. Writing to his brother Tom in 1863, William describes him as "oldish," but "A 1." The letter, with others, formed part of the grangerised "Comments on Corpulency [and] Lineaments of Leanness," by W. Wadd, surgeon extraordinary to George IV., which was knocked down for £40 at the recent Broadley book-sale at Messrs. Hodgson's. The book should have gone to a large medical library. William Banting was an unconscious humorist and the cause of wit in others. He refers to his obesity in his quaint pamphlet as "the parasite of barnacles on a ship. If it did not destroy the structure, it obstructed its fair, comfortable progress in the path of life."

Punch began on "Banting" in 1864. According to his nautical metaphor, Mr. Banting had been in dock 20 times, but had effected no repairs till he came under Mr. William Harvey, F.R.C.S. *Punch* sings as follows:—

> Some glutton has stated that brave Mr. Banting
> Himself has succumbed to the system he taught.
> 'Tis false, and he lives, neither puffing nor panting,
> But down to a hundred and fifty pounds brought.
>
> He's done it, and so may each overfed nigger
> Who'll simply adopt resolution severe
> To avoid, if he wouldn't grow bigger and b'gger,
> All bread, butter, sugar, milk, taters, and beer.
>
> Take a fresh lease of life and commence a new era,
> Mr. Banting's advice makes one long to begin—
> "Drink claret and sherry, good grog, and Madeira,
> Take four meals a day and—grow gracefully thin."

Such is "The Banting Code." On another page we have "The Banting Restaurant Joint Stock Company (Limited)."

> "This will devote its earnest attention to the preparation of viands which, whilst excluding, as much as possible, saccharine, farinaceous, and oleaginous matters, shall nevertheless administer, in the highest degree compatible with the absence of those savoury substances, to the pleasures of the palate."

The humour of mere corpulence abounds in the *Punch* of 1864–65, but obesity is apparently always regarded as a result of over-eating; pathological obesity, such as Daniel Lambert suffered from, is not recognised.

INTRUDING ANTS.

To the Editor of THE LANCET.

SIR,—Recently I have heard many complaints concerning ants (sometimes called emmets, pismires, &c., in the country) getting into larders, pantries, and food-cupboards. Perhaps the prolonged drought has left them free to multiply. Latterly I was puzzled to know how ants got into the house, but accidentally discovered one means. The portable dust-bin used to stand on concrete, but some weeks ago was placed on earth in the corner of the garden. The ants had made a "hill" underneath it, and when the dustbin was carried through the house to the front roadway for the periodical removal by dustmen, the ants clung unseen to the bottom of the dustbin, which, being heavy, was put down half-way through the house. Then some of the ants scampered around unseen inside the house. They find their way without much delay to the food-cupboards and pantries.

I have read of mixtures of paraffin and benzoline in equal parts, and of a mixture of snuff and powdered black hellebore. I know that many people pour plain paraffin on the tracks outside the house, lay about sticks of firewood soaked in creosote and paint places with carbolic acid inside the house, but these methods are not pleasant to use near food. Perhaps there are other methods. The above are at least 30 years old. Of course I know one can always kill them individually, but it is tedious work.

I am, Sir, yours faithfully,

London, June 18th, 1917. R. T.

*** The following are popular remedies: Powdered cloves with borax (oil of cloves thinned with methylated spirit could be worked up with the borax), or camphor 1oz. with borax 1 lb. Turpentine is a well-known and efficacious remedy, but not pleasant for food-cupboards.—ED. L.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

[1] THE LANCET, June 9th, 1917, p. 898.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East.

TUESDAY.—5 P.M., Croonian Lectures:—Lieut.-Col. J. G. Adami, A.D.M.S.: Adaptation and Disease. (Lectures IV.)

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. B. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. B. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.

THURSDAY.—5.15 P.M., Clinical Lecture.

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY.—4 P.M., Lecture XI.:—Major Sir William Milligan, M.D.: The Value and Importance of Physical Exercises from a National Standpoint. Followed by a discussion.

The following journals, magazines, &c. have been received:—Canadian Journal of Medicine and Surgery, Journal of Laryngology, Rhinology, and Otology, Revue de Chirurgie, Saint Paul Medical Journal, Journal of the Royal Sanitary Institute, Indian Medical Gazette, Journal of Nervous and Mental Disease, British Dental Journal.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

Offices: **423, STRAND, LONDON, W.C. 2.**

MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8d. The rates of subscription remain as revised in October.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C. 2, are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION is published in time to catch the weekly Friday mails to all parts of the world.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

Subscribers abroad are particularly requested to note the rates of subscriptions given on page 4.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the rates shown, whatever be the weight of any of the copies so supplied.

NEWSPAPERS FOR NEUTRAL COUNTRIES.

Newspapers are not at present being sent forward to neutral European countries unless posted direct from the office of publishers or newsagents who have obtained permission from the War Office for this purpose. The Publisher of THE LANCET has obtained the required permission, and he will forward copies direct from the Office to any neutral country on receipt of instructions.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, June 20th, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
June 14	...	127	81	62	62	65	Cloudy
,, 15	...	123	84	59	61	69	Fine
,, 16	...	116	84	64	65	75	Fine
,, 17	0·23	126	88	69	74	80	Fine
,, 18	...	128	86	64	69	76	Fine
,, 19	0·39	116	74	63	57	69	Cloudy
,, 20	0·05	123	76	59	62	67	Cloudy

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

Communications, Letters, &c., have been received from—

A.—Messrs. Adlard and Son, and West and Newman, Lond.; Messrs Allen and Hanburys, Lond.; Messrs. Arnold and Sons, Lond.; Anglo-French Drug Co., Lond.; Capt. D. C. Aikenhead, C.A.M.C.; Capt. E. D. Adrian, R.A.M.C.; Australian Institute of Tropical Medicine, Townsville, Librarian of; Dr. H. Ayoub, Medani; Dr. M. Afifi, Abbassia.

B.—Mrs. E. Black, Campsie Glen; Sir John Broadbent, Bart., Lond.; Benger's Food, Ltd., Manchester; Dr. W. Bramwell, Liverpool; Burma Government, Sec., Burma; Capt. W. Langdon Brown, R.A.M.C.(T.); Birmingham City, Medical Officer of Health of; Capt. E. C. Bowden, R.A.M.C.; Mr. W. Bryce, Edinburgh; Messrs. Butterworth and Co., Lond.; Messrs. J. Beal and Son, Brighton; Messrs. Brown, Boveri, and Co., Lond.; Mr. G. Bethell, Lond.; Dr. J. Bourguet, Paris; Dr. T. B. C. Broadway, Dorchester; Mrs. R. J. Becks, Kettering; Mr. F. W. Beville, Bath; Barnstaple, Medical Officer of Health of; Dr. A. H. Bizarro, Whitchurch.

C.—Messrs. Cowie and Co., Lond.; Major J. D. Cowie, R.A.M.C.(T.); Prof. A. R. Cushny, Lond.; Cumberland and Westmorland Asylum, Clerk to the; Messrs. J. and A. Churchill, Lond.; Coventry and Warwickshire Hospital, Coventry, Sec. of; Committee for the Investigation of Atmospheric Pollution, Lond., Hon. Secs. of; Dr. J. A. Cameron, Ipswich, Queensland; Messrs. Chesterton and Sons, Lond.; Messrs. Clement and Johnson, Lond.; Lieut.-Col. J. W. Cornwall, I.M.S.

D.—Mr. J. H. Donaldson, Lond.; Mr. F. E. H. Daunt, Lond; Denver Chemical Manufacturing Co., Lond.; Mr. A. Dawson, Lond.; Dr. R. Donaldson, Reading; Messrs. W. Dawson and Sons, Lond.; Mr. H. Dickinson, Lond.; Mr. A. Doody, Tonbridge; Dr. V. Dickinson, Lond.; Mrs. M. Dimsdale, Bourn, Cambridge; Dr. W. T. Davies, Llanbister.

E.—Surg. A. G. Evans, R.N.; Dr. H. A. Ellis, Middlesbrough.

F.—Dr. F. Foord-Calger, Lond.; Messrs. Flatters and Garnett, Manchester; Mr. W. Fleming, Lond.; Foreign Press Office, Barcelona; Lieut.-Col. Sir J. K. Fowler; Factories, Chief Inspector of, Lond.; Dr. W. M. Fletcher, Lond.; Messrs. Flatters and Garnett, Lond.

G.—Mr. B. J. Gibbs, Southsea; Gloucestershire Royal Infirmary, Gloucester, Sec. of.

H.—Lieut.-Col. Harris; H. S.; Hercules Tyre Co., Northampton; Lieut. J. W. Hayes, A.V.C.; Holborn Surgical Instrument Co., Lond.; Dr. P. Harper, Lond.; Messrs. Hirschfeld Bros., Lond.; Mrs. Haward, Lond.; Lieut.-Col. L. W. Harrison, R.A.M.C.; Dr. C. Hutt, Brighton; Howard Association, Lond.

J.—Mr. P. A. Jones, Birmingham; Messrs. J. A. Joseph and Co., Bombay.

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Y.—Dr. E. Young, Lond.

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The Cavendish Lecture

ON

A DAY'S WORK.

Delivered before the West London Medico-Chirurgical Society on June 22nd, 1917,

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MR. PRESIDENT AND GENTLEMEN,—"The Canadian Corps is ordered to take the Vimy Ridge." So ran the official order. Never was an order obeyed with greater alacrity or executed with more complete success. This task was set in January; it was performed on Easter Monday. It is of that day's work I propose to speak.

But, first, I take leave to assure you that I am fully sensible of this high honour—an honour which is shared by all who come from overseas: addressing an audience such as this from a foundation so famous as the Cavendish, made still more famous by the long line of my predecessors in this office.

As I scan the roll three persons arise before me with singular clearness: Jonathan Hutchinson, who first directed my young feet—they were young in those days, although they have since made many a weary step—towards the London Hospital, where I learned the master truth that nothing pertaining to humanity is alien to the practice of medicine. It was in his company on the hills of Surrey I first heard the lark sing as it sang that day over the trenches in Artois. Next on the roll is Frederick Treves, from whom I learned the purity of surgery—for in those days surgical cleanliness was quite new; and, last of all, William Osler, who gave to medicine in the New World a fresh direction and an upward turn.

There was a time when even in such company as this I should have felt no embarrassment, for the professor's gown had been familiar to me, and I was accustomed to the use and even the embroidery of words. But I have long since abandoned the way of letters, and left that no-man's-land of ambiguity, where jest and earnest meet. Fresh, now, from a life of reticence, in which yea is yea, and nay nay, I listen with alarm to the sound of my own voice.

Nor do I fail to remind myself that this is a scientific assemblage accustomed on such occasions to the precision and austerity of science. Far from laboratories and books, concerned, for the most part, with horses and men, content with a hasty guess at diagnosis, and practising the rough surgery of the field I am fully aware that to-night I am doing deliberate violence to that long tradition of science which has made the Cavendish lecture sacrosanct.

THE SCIENTIFIC SPIRIT.

But, having embarked upon this new adventure, I shall be bold, and look even Science in the face. We are at war not alone with flesh and blood, but with principalities and powers. One of the principalities and powers with which we are at war is that unmitigated scientific spirit which is the peculiar possession of the enemy and is, happily, alien to our race.

That spirit is not our inheritance, yet none have done more than we for the advancement of real science, including the ancillary science of medicine and all sound learning. When I practised the trade of Professor of the History of Medicine I always regarded Sydenham as the great exponent of our method: "I take the view," he said, "that we shall go without any hypothesis, and study the conditions as they appear—the process before the explanation."

Upon many occasions I have developed that theme, but such is not my task to-night. Yet I cannot refrain from reminding you of an example, because it is the most recent, the work of James Mackenzie, who, by 20 years of quiet, patient observation set at naught the meretricious theory of the German upon the action of the heart. The German works in science as he works in war. He loves the underground. He throws out saps; he lives and moves and has his being in the darkness, when suddenly the free English spirit comes over the top in the full light of day.

Science with us is only a part of Life and a development from it. Our medicine is but a closer definition of what our fathers knew. The snake in India, the brazen serpent in the wilderness, the cat in Egypt—these sacred emblems indicate that those ancient peoples understood the genesis of "plague." This badge of maple leaves which I wear is copied boldly from a Roman coin, struck to commemorate the discovery that malaria can be mastered by draining the land and planting trees.

Let us grant to the uttermost that the pursuit of science is the pursuit of truth. The German cares nothing for the pursuit; he is all for the result, unaware that any given truth by itself is half a lie. There is the truth of the soldier, which is courage; the truth of the artist, which is beauty; the truth of the woman, which is virtue. The German believes that he has attained to all truth when he has discovered only a partial truth, forgetting that God alone is Truth, and that no man has looked upon God and lived. A lie which is only half a lie is far less deadly than a partial truth which is believed to be the whole truth.

Even to science the scientific spirit is fatal. It becomes dogmatic and then sterile. We have always kept in mind that there is a spiritual law in the natural world, whilst the German, lacking a philosophy of life, takes what he filches, and develops it in the cold void of abstract science. That is the genesis of his superman, a monstrosity developed from the tentative hypothesis of our own Darwin. Nay, more, the scientific spirit is the enemy of life. We live not by truth but by illusion, and the human heart creates those illusions which alone make life tolerable. There is a profound instinct which impels us to war against the truth, against reality. We eschew the fact, and take refuge in evasion. From the facts of life we fly to hope. The human race has nourished itself upon fiction, myth, and miracle. It still finds its fulfilment not in life but in immortality, not in formulæ but in religion.

The strength of the English race lies in its capacity to live and move in the realm of illusion, of poetry, whereby it discovers the higher truth and enters into the realm of emotion. The German, on the other hand, has deliberately shut himself out from this realm. As a consequence he sees darkly, judges falsely, fatally. He cuts himself off from the tree of life, and by becoming a scientist—"falsely so-called," as the Apostle is careful to specify—is become a beast without a background. One of your own has said it. We may then depart with some freedom, this year at least, from the tradition, and look at a common day's work.

THE SCENE OF ACTION.

I have selected as a text this day's work merely because by a piece of good fortune it fell to our division to act as the point of the spear. Two Scottish divisions held one flank, and many a man went forward with a lighter heart on that account. The 13th Brigade—of an English Division—went over with us, those wondrous English soldiers who work in a rage and then fall into silence. Down Arras way the Australians were working, those handsome soldiers who will not hold back. When they get a free road to Berlin there will be such doings as the Seer never saw from Patmos. Our comrades from South Africa and from New Zealand were engaged elsewhere, as all the world has since learned.

It would be a misuse of the occasion and a mis-spending of this short hour to attempt a description in detail of that day's work. The result would be merely a piece of journalism. No description can make intelligible the events which happen in the operating-room or the lying-in ward, and there are many subjects over which it is proper to draw the veil. I should merely mislead you. The task can only be performed by an artist with time and space for selection. By an infinity of small things he would create a picture. He would make you see a long cliff, extending for 20 miles from the north-west to the south-east, in shape like a dog's hind leg, with the Souchez river breaking through at the joint. He would lead you up the landward slope, over ridges and valleys, until you came to the summit. He would guide across a high plateau, and from the edge you would look down upon the old sea which is now the French Flanders plain, with its red villages and green fields. This is the Vimy Ridge, which rises from Souchez and slopes down to Arras.

You should know also that it was on this very spot, and upon the Lorette Ridge, which is the twin ridge to the north, across the Souchez river, that the French made their supreme offensive in 1915. Here was the Labyrinth—

Souchez, Neuville St. Vaast, Ablain St. Nazaire, La Targette, and Aux Rietz—where rifles were discarded and knives served out in their stead. Upon these heights lie 60,000 of their noble dead in fields of crosses which extend as wide as a forest. At the time we were somewhat insensible to this great struggle.

More than 18 months had passed, until on that April morning the business of the Canadian Corps was to pivot upon its left flank, and drive the enemy into this old sea bottom, which was done according to schedule in 468 minutes. I say minutes, because the plans were drawn as rigidly as that, and they were drawn in as fine detail as an architect would employ for the building of a house. For three months we worked upon those plans with as much care as one would bestow upon a performance on a stage. The humblest actor had his rôle, and he was ready against the hour when the curtain should rise.

A DIVISION: ORGANISATION AND LIFE IN THE TRENCHES.

An army is an extremely simple affair. It is composed of divisions, each one of which is self-contained, and has a staff with several branches. One branch deals with operations; another has to do with the persons who are to carry out those operations; a third is concerned with the housekeeping, by which all are clothed, housed, fed, and cared for in sickness and wounds. It is with this branch the medical service is identified. To each man it appears that he alone is carrying on the war, and in a sense he is. If he fails, something else goes wrong until all may be in jeopardy. In the end some single man in an army, like a housemaid in a house, has to do any given piece of work. I shall offer you an illustration. There is no water on the Ridge, and men need water. It was the business of a housemaid—he was really a staff major—to provide water. In the winter he began collecting petrol tins, and many a night I have heard him adjuring marauders to leave them untouched. To make quite sure, he had them stored behind his own hut until he had accumulated a pile as big as a church. One by one he had them burned out. He had special pack-saddles made to accommodate six tins. He filled these tins with sterilised water and had them loaded on mules. The pack-train was ready before the battle began, and the men drank water in the hour of their need. It was by no accident the Vimy Ridge was won. It was carried by the same methodical process by which a piece of land is farmed, a dinner party made a success, or a stage performance a triumph.

It is difficult, too, for you to appreciate how small is the battle area occupied by a division. It measured in this case 2000 yards in depth with a frontage of 1000 yards—about the size of a nice farm. This area was approached only by night or in fog, though ambulances and persons singly on foot might take a chance. Once the area is entered all life is underground. The road from Arras to Bethune runs at the rear, and the ground slopes gently upwards to the ominous crest of the flat-topped, gloomy Ridge. Through the bank by this road four trenches enter: two for going up, two for coming down. These trenches are joined by laterals according to the configuration of the ground, and one must learn his way about as a worm would learn his particular cheese. It is all very mysterious at first, but in time becomes as familiar as the streets of London. To cover the whole ground required a full day, and in clear, dry weather no exercise could be more pleasant, the trench floors clean, the walls defending from the wind, a strip of sky overhead, and it might be the voice of a lark against the background of noise.

It was a bitter winter there, as here. The soil was frozen to a depth of 14 inches. Rain fell. There was little drainage. The earth slid in on top of the water, and was trodden into a mess like dough. To walk the trenches under such circumstances is the last test of human endurance. On earth one can walk; through water one can swim; but progress can only be made inch by inch when earth and water are mixed in due proportion. One wears rubber boots hip-high, and from the tops a strap is fastened over the shoulders to prevent the boots being pulled off by the mud. On one occasion my orderly lost boots and socks, and came in with bare feet. If a man falls he may be lifted over the parapet, and left there till night; or he may lie where he fell, and be trampled under foot. It requires very little resolution to die: life is so hard, and death so easeful.

MEDICAL ARRANGEMENTS.

When we took over early in February our business was to devise medical arrangements in accordance with the battle plan, by which casualties should be removed to a main dressing station on their way to railhead. No one system will suit all engagements, and the system must be devised in view of defeat as well as of victory. Happily our labour was largely wasted, since the advance was so rapid that our underground fortress dressing stations were not urgently required. This was especially hard on the man who laboured all winter at the construction of the posts. One officer almost wept with grief when he saw our troops storming overland rather than make their way through a series of tunnels to which he had devoted a year in constructing. In this area we spent two months excavating ten dug outs, commodious as this room, 20 feet below the surface, shoring the roofs and walls, and fitting the place with racks for stretchers. Nearly all this work was done by the medical personnel under the supervision of a sapper. Remember, too, that the work could only be carried on by night, in fog, or in quiet intervals during the day, and that every stick had to be carried through such trenches as I have described.

Regimental aid-posts and field ambulance relay posts were parts of a system which ended at the rear of the battle area where a huge advanced dressing station was partly excavated and partly built. Two tram-lines had been thrust up by night on either flank to be used for sending ammunition and rations up, and they were of great service in bringing casualties down.

Let us now attempt to follow the progress of a wounded man. When he falls he is attended by the regimental medical orderlies and is sent back a few hundred yards by regimental bearers to the aid-post, where he is more carefully dressed by the regimental medical officer. There he is handed over to the field ambulance bearers and borne by hand, by wheeled stretcher, or by trolley from one relay post to another until, finally, at a distance of one or two miles he arrives at the advanced dressing station. There the dressings are examined and, if necessary, renewed. Trains of trolleys drawn by gasoline engines are in waiting to bear the loads farther to the rear, where they may be accessible to the motor ambulance convoy, which takes them to the main dressing station. Here the cases are re-dressed and so sent on to railhead, clean, warm, and fed.

Of the wounded in detail one sees little; one sees them in the mass. Our business is to speed them on their way, and 12 surgeons in a dressing station, working night and day, will clear the casualties as fast as they are brought in. The walking cases went direct from the field to collecting points and were sent down in 'buses, 40 at a load. The lying cases neither move, nor speak, nor utter a sound. It is only when we go to the base or come to England that we see the wreck of war and the pity of it all.

I cannot insist too strongly that medical arrangements must be devised anew for each action; they vary with the plan of battle, and must be modified as the battle proceeds. On the day in question an ample supply of blankets was assembled, but in the night a bitter wind arose, with wet driving snow. Within an hour 600 additional blankets were at the front, assembled and transported—it does not matter how.

Zero hour was at the dawn of a bleak morning. By 6 o'clock the wounded were coming in; by 7 the prisoners were marching down by companies; by 8 the supply trains were moving up, and by 9 o'clock the whole world was alive with men and horses and motors over roads that were spewing up their stony entrails. When the action was over the battle area was like a heavy cross-sea which had been partially transformed into land. Further advance was impossible by reason of the elements, earth, and water.

DIFFICULTIES IN THE ADVANCE: RAPID EVACUATION OF WOUNDED.

Wonder is often expressed that after a large action the advance is not more rapid. The example of little things will help towards an understanding. The morning after, I was making my way through crater and crevass upon some special business, when I saw a boy gathering flints in a sand-bag. We two seemed to be alone in the world. There were others, but they were concealed as they toiled up the holes and hollows. He was finding material to make cement for wheel bases of the guns. A mule climbed out of the earth. He had a pannier with six shells on each side. The advance was laborious as that. Horses must have footing, else they will go downward instead of forward. Roads must be built from the bottom upward, and material for railways must be carried by the strength of men.

Sixteen battalions were engaged on this 1000-yard front, 16 men to a yard. Each one had its piece to do, and when done another battalion passed through and took up the advance. All winter the performance had been rehearsed behind the lines on a terrain marked off with tapes to imitate the battle area as discovered by aerial photographs. To each battalion was allotted a certain number of minutes for its task. All was over by 2 o'clock, and before darkness fell the field was clear. The evacuation from the front was so perfect and rapid that cases began to accumulate at the advanced dressing station; and there they lay, a piteous spectacle, but their presence was the finest tribute ever paid to the Medical Service. A general passed by, and when he saw the wounded lying in ranks on each side of the road, covered with snow, he thought the Medical Service had broken down, until it was explained to him that all casualties were dressed and fed, eased with morphia, and covered with blankets, instead of lying where they fell. Additional convoy was procured, and by midnight all were in their beds. That day's work was over.

THE MEDICAL SERVICE OF A DIVISION.

You have heard much of our unpreparedness for war, but the Medical Service leaped up full-armed when the first call sounded. For long years the Royal Army Medical Corps had worked upon the problem and found a plan. This plan had been adopted in Canada, was well understood, and the two services have operated in a perfect harmony. The best of the profession volunteered, and many of them had some previous training in military affairs. In my own small unit we had in command a surgeon of the first rank; second, an officer who was at once a surgeon and a soldier; third, a dermatologist of the first class, two accomplished physicians, and at least two surgeons who had already had a thorough training. Indeed, I have heard it said that the professional qualification of the men at the front is too high. A man who can succeed in medicine and surgery can succeed at anything.

It is a canon of military law that one may neither praise nor blame his superior officers; and I am neither praising nor blaming when I say that our D.M.S., Surgeon-General Foster, is a master of organisation, proven by two years' service in the field from Ypres to the Somme and back to Souchez; that Colonel Ross, his successor in the corps, has not left the front since the early days of 1915; that our A.D.M.S., Colonel Fotheringham, was on the strength for nearly 30 years, and had long been one of the leading consultants in Canada; and that his successor, Colonel Jacques, who was in immediate command during that day's work, has had 10 years' experience in the permanent force. It was, then, not by accident that the work went well.

It must be hard for you to understand how strictly military is the Medical Service at the front, that is, the service in the division as distinguished from the service on the lines and at the base. Between the two a gulf is fixed; and it is with the division we are especially concerned to-night. In a division there are about 20 regimental medical officers, and three field ambulances with 9 medical officers each, or 27 in all. The personnel is divided into bearer, tent, and transport sections, comprising 250 men, or 750 to the three ambulances. For transport each ambulance has 50 horses, 7 motor and 3 horsed ambulances, with general service, limbered wagons and carts. Each section is self-contained, and marches with bearers, tent orderlies, transport, and equipment. At any moment a section can fall out, march off, and open up with all appliances for life and work in the field. Fuel, food, fodder and water are carried which suffice until rations are drawn. The sections can be as quickly assembled, and the bearers of all ambulances may be pooled for such large operations as took place at Vimy and on the Somme.

For such precise movements a high degree of military training is essential; and in physique the men must be the best, for the work is heavy and the marches arduous. These ambulance bearers and their officers have their advanced headquarters 200 yards from the parapet in the regimental aid-posts, and in action they go over just behind the infantry. They are trained soldiers, the transport carried arms until quite recently; they were practised in musketry, and all were qualified to take their place on parade with the other elements of the division.

The Red Cross no longer exists except as the emblem of an eleemosynary institution which provides an outlet for the love of civilians for their soldiers. The Medical Service has become an integral, and not an ancillary, part of the Army. The Red Cross provides no especial protection because it is so closely identified with the service that neither side can recognise it, although I am bound to say that I have never seen any deliberate violation of the traditional emblem. On the contrary, I think the enemy has withheld his fire from our stations which could be observed as such. He has, of course, destroyed our ambulances by shell fire; he has killed our officers and bearers; he has dropped shells and bombs upon our stations—but that is the chance of war.

A field ambulance, then, is not especially a medical problem. In my own unit, which contains nine medical officers, the Colonel fell at Courcelette, a Major gained the D.S.O., two Captains won the Military Cross, two were mentioned in despatches—all for military virtue as apart from professional knowledge and skill.

PREVENTION AND TREATMENT OF SICKNESS.

But this day's work was merely an incident or an interruption in the regular work of the Medical Service. We have several million of men to keep in health and care for in sickness, and the system by which those ends are gained is much more efficiently organised than it is here in London for the civil population. First come sanitation and prevention of sickness. In all this time I have never detected a foul odour except the fœtid odour of asphyxiating gas or the noisome smell which arises when an old burying-place is disturbed. Except for a few days on the Somme, I have not seen more flies than one would see upon a well-kept farm. Purified water is put into the men's bottles. To drink from an unauthorised source is a crime. Wells are examined even whilst they are yet under fire and the food is scrutinised before every meal. Men are bathed as methodically as they are fed, and by fire and steam the advances of the humble, but friendly, louse are discouraged. One acquires a certain pity for this most dependent and helpless of all creatures—his means of livelihood are so restricted and he is so unbeloved. A battalion of 1000 men can be inoculated in 35 minutes; that is an illustration of the speed and organisation of the Service.

The number and variety of hospitals is almost perplexing and it taxes one at the front to remember where each class of case is to be sent. Mild infections go to one place, more virulent cases to another, and the channels are kept distinct. There is segregation or quarantine, and a mobile laboratory is always available for exact diagnosis.

I am astonished continually at the extraordinary talent that is available. London itself is not more rich. Specialists abound on every hand. A man came to me with an obscure skin disease. I referred it to our Major, who just happened to be a dermatologist. He named the condition "erythema multiforme exudativum iris." The diagnosis was written on a field medical card, and with the man it went forward to England. It came under the eye of one of the most famous of London specialists. He sent back an inquiry through the usual channels because the diagnosis was correct; and he was, I thought, a little irritated, as he supposed no one in the Army but himself was entitled to make so fine a distinction. It turned out that this young Canadian Major had once been a pupil of this London dermatologist.

The Medical Service, above all other services, has done its perfect work. It has yielded an army without sickness. I have never seen a case of typhoid, and the few infectious cases are of the nature of children's diseases—measles, mumps, chicken-pox. For the first time, also, in the history of the world we have an Army which is free from venereal disease. For a time it was part of my business every morning to scrutinise the returns from 30,000 men, and days would pass without a single case, especially when leave was off. We have come to think of London as a place where men contract venereal diseases. That is a saying which I commend to you. There are occasional sporadic cases. To conceal the disease is a crime. The infected man is handed over to the assistant provost-marshal, who ascertains the source and has the source of contagion deported. The disease is regarded as a self-inflicted wound by which a man may secure his return from the front, and some base fellows contract the disease deliberately, just as they shoot off their fingers or toes. In one house were two women. One of them was infected and the other was free. The one who was infected demanded 4 francs for her services; the other had to be content with 2. I can recommend

to you a provost-marshal who will free England from venereal disease in six months. It might be worth the effort.

The Medical Service is no longer the poor relation of the Army. By the miracle it has performed of keeping the Army fit the consideration accorded to the service is unbounded. New problems face it every day, problems that must be solved. Trench feet in the first and second winters were likely to cripple the Army. Last winter the methods of prevention were so sure that a case of trench foot was a curiosity and brought stoppage of leave upon a battalion which produced them. Medical officers may not command; they advise. But he would be a rash commanding officer who would disregard advice repeatedly given.

For a year we were perplexed by trench fever, and I am afraid we showed too little sympathy with the men who were suffering from the malady. The pain in the shins, which is almost intolerable, was too often attributed to myalgia, but, thanks to the service at the base, we now know better. We have learned to discriminate between the varieties of "shell shock," which range from cowardice to mania.

THE OUTLOOK.

By that day's work on Vimy Ridge we convinced ourselves, and proved to the enemy, that we cannot be beaten. After that other, and later, day's work on the Messines Ridge—a ridge I watched for 11 weary months—we can say with surety that we shall win, that the enemy will be defeated, that he will defeat himself in the slow effluxion of time. We are now free to prolong the war until it suits us to bring it to a close. Up to the present we have been fighting for our lives, unable to indulge with confidence in the full hope of a slow, relentless, methodical victory.

In the beginning we were inclined to take the German at his own estimate of himself, to look upon him as a tree walking. Now we have the true measure of him, and we are not in the least afraid. Docile yet courageous, hating other lands yet loving his own, hysterical yet obstinate, he continues to be a formidable foe. Although we have long since matched him in equipment and surpassed him in organisation, we still deceive ourselves about his powers of subsistence, since comfort to him is penury to us. We were close upon his heels in Vimy village, and a detailed examination of his abandoned stores was not encouraging. In one dug-out there were sides of bacon, abundant bread, potatoes, bottled waters, dressings, drugs, articles of new, sound leather, phonographs, and a copy of Kant—by no means a bad equipment for carrying on war. Prisoners who have helped us to clear many a field are capable and diligent, with a certain patient, pathetic helplessness, but a high confidence even yet. Nor do we forget the surety of the enemy's intelligence and his quickness to act upon the results of his experience. Liège, Namur, and Antwerp taught us the futility of the Vauban fortress. Vimy and Messines taught him the futility of massed trenches, and he instantly adopted a new defence. His line is now not a line. It is a fortified country; but to that also we shall find an answer.

The end is not yet, nor is it even in sight. My counsel is that you should close your eyes to the end. Look upon war as a normal condition. Forget it, as all normal things are forgotten. Cease praying for a speedy end—and peace, else you will acquire what the French call the psychopathy of the barbed wire. Peace and the end will come when your unhampered armies shall have performed their task. At one time there was ground for alarm, and excuse for panic. Now there is none. This very night we see the days grow short for the fourth time since we took arms in our hands. Several times we shall see the days grow long and short again before we shall have our will upon our enemy; but we are now free to turn our eyes away from the thing itself and to reflect upon it, to scan the long course by which we have arrived, and so shape our course towards the end—in short, to examine our experience and be governed by it.

In these three years we have seen grow up the most perfect military organisation the world has ever known. This force was created by the genius of this people. It has arisen out of their life, out of their traditions, out of their way of doing things, the tradition, namely, that each man shall go upon his own way with unimpaired liberty, to think, believe, and talk as he likes, to trade as he likes, to work, or refrain from working, with perfect assurance that in time of need the old, dull instinct and dumb sagacity of the race will assert itself, that every man will fall into ordered ranks and proceed upon the appointed way, even unto the end.

THE INSPIRATION OF ENGLISH LITERATURE.

All these years I have heard a cry of self-deprecation and self-pity that we are not as other men—even as the Germans—are. I have seen it urged, for example, that we should retain the classics in our schools, since the Germans spend more time upon classics than we do. The Hun is yet in our hearts. He discovered the association between the teaching of science and material prosperity. There are, on that account, persons now amongst us, interested in education, who never thought of the subject until it was presented to them in this light. If they had their way we should lose the war even by winning it. We have put the matter to the test, and it will be time enough when we have lost to recast any element of our life in a Germanic mould.

We have put all upon the cast of war—our lives, our property, our way of life. We have not yet won. We shall lose, and we shall deserve to lose, if now we are false to the civilisation by which we have attained to these heights, and forsake our old custom—namely, "to defy power which seemed omnipotent, never to change, nor falter, nor repent." We have no cause for repentance. This is not the time to falter or change. You English require no alien teacher. Trust your own. It is written in your books. All else to you will be as a garment put on. Trust your Chaucer, your Shakespeare, your Dickens, your Kipling. They will carry you through. Trust your own poetry, and let German science go. Poetry is the last possible utterance of humanity. Not by wisdom alone do poets write poetry. By some sort of inspiration they say many fine things, and do not themselves understand the meaning of them. It is the Race which speaks.

Illusion is the prerogative of the English. Their strength lies in that; because it goes with eternal youth. When the illusion fades old age has come upon us. It is the inspiration of all our literature, for great writing and all religion is an attempt to weave a veil of beauty to hide the facts of life. All other writing is an attempt to tear this veil aside. This in the work of the cheapjacks of literature and of religion. Religion and literature are great according to the promise which they hold out, like the promise of spring which by some magic persuades the hungry human heart that even the dead will come back to life, the promise to youth of the perfect woman—all dreams of youth which men reverence even after they are awakened. Above all others we have created the illusion of war in virtue of which men go eagerly to their death. If it were not for this quality how should we have survived those dreadful days of 1914?

THE LESSONS OF THE PAST.

To this old race there is nothing new. This is not the first time we have been at war, nor will it be the last. War is always the same in principle, though it may vary in method. Even the battle-fields are the same from the time of Cæsar until now. On the way up from the Somme we followed the very road by which the war-like Henry retreated from Amiens and Peronne and we passed within a little of the field of Agincourt. This area might well be set apart by this new League of Peace as lists which nations must use when they feel that they must fight. At first the situation was new to us. It is over a hundred years since we were at war. All affairs in the interval were merely expeditions, and we still describe our considerable establishment in France not as an army or armies, but as an "Expeditionary Force."

We made one miscalculation—only one. We were well aware that a nation goes to war as a pastime or diversion from the *ennui* of peace. For the first time in our history we found ourselves face to face with an enemy which attacked us as a matter of business.

But for all else you will find precedent. Look in your own old Langland and you will see as in a looking-glass the situation in which we find ourselves to-day. This very people was in trouble with war and want of food. Piers Plowman offered to guide them to the truth, for, he said, Conscience and Mother-wit had showed him her dwelling. But, first, they must help him to finish a piece of ploughing. Remark that the Plowman does not employ women on the land. Those of the common sort are "to sew the sack to keep the wheat from spilling," to "spin wool and flaw," to "weave cloth," and teach their daughters the art. Lovely ladies are to make embroideries "to honour churches." The knights, too, were eager though ignorant. "Teach me,

quoth the Knight, and, by Christ, I will try." The Plowman would have no amateurs—women or men. Let the knight administer justice so as to "keep down the wasters and the wicked men who spoil the world." Then they all fell to work "full eagerly" each man in his own way.

I take it upon myself merely as a Voice to utter one word of warning to this people. It is for England we all are fighting, the England of history, not for a Utopia or any figment of disordered minds. There are disordered minds in our absence working to wrench the old internal polity from its foundations, and no department of life is to remain untouched. There is to be a new electorate, a new drink or no drink at all, a new religion, a new education.

We know what labour is; but we do not know a Labour which confers, and deputes, and strikes, and has Ministers of its own. When a section of the community develops an interest and authority apart from the interest and authority of the community as a whole, there is then in the organism an overgrowth which is at first a foreign body and eventually becomes indistinguishable from a cancer.

In all this spectacle of war the noblest spectacle of all is "the golden metall of our souldiers"; and the means by which we are attaining to victory are the means by which victory has been attained from the days of Ralegh even until now—namely, "the employment of our common English souldier leavied in haste from following the cart or sitting on the shop-stall." To this we have added a new element, the very flower of the flock, the precious offspring of the universities and schools, all our beauty and our youth.

Has this "souldier" from the soil done so badly that his children must be educated from books after the technical, practical, Gradgrind, German method? The soldier will see to it. He himself may have been educated to such a point that he knows the nature of the soil, the place and time for sowing his corn, the public-house which sells an ale most tasty to his palate, the choicest spot in the parish for sunning himself on a Sunday afternoon. In this new hard school of poverty, temperance, and obedience he has educated himself still more finely, and by practising those virtues he has made of himself a "sufficient man."

Only the other day I read a solemn lamentation over the indisposition of the English to speak with foreign tongues. An experience in a ship trading in the Levant was cited. The captain had traded along these coasts for 20 years, and yet could not speak a word of Italian or Greek. His method of unloading his ship was to take a big stick in his hand, make himself red in the face, sweat at every pore, and curse in his own vernacular, whilst an Austrian lying alongside was addressing the natives in their own language. The narrator adds, however, that the stevedores grinned, wondered, and obeyed the English sea captain. It may be that he had the proper way of unloading a ship, and that his education was the best for life in the Mercantile Marine.

THE MESSAGES OF WAR.

The value of war lies in this: it restores simplicity to life, and brings down the top-hamper which peace has superimposed. At the moment you are striving to reform a social life which is passing away. This generation has been dominated by the machine; and all effort has been expended upon machines for making more machines instead of towards the work itself. Science has been crying aloud: "Come and see what I will do for your souls"—and we have seen. I think that in future his giantship will go somewhat crestfallen, and that machines and those who tend them will have less power.

The danger of insidious revolution is a real one. By winning this war we may lose it. Equal in importance to winning the war is making ourselves worthy to have won it. The winning of three wars was the ruin of the German, and we have seen the process of degradation with our own eyes. Up to the present generation there was a German with human ideals, that Germany about which Carlyle gabbled—by which he wrought us much evil—and Matthew Arnold, the first of our own heretics, vaunted continually; but we have seen it become detestable by reason of a carnal and spiritual vulgarity. There is no primitive truth in its inward parts; even when its words are sincere its thought is double. This people, which was once great, took its place at the mill like a blinded giant, turning out meanness and cheapness for any Philistine. It lost all sense of beauty. Music died in the orchestration of Wagner and the heathen shouting from the stage; literature perished in a contemplation of their national hero who sacrificed his soul for the lusts of the flesh—an elderly professor with the powers of Hell at his command, whose ultimate good was science and the violation of women.

Even yet I see no signs of repentance. Evil is yet their good. But I think I do witness a sign that the just and righteous judgments of God are about to fall upon hardened and unrepentant sinners, and that this Caliban which yet, alas! squats athwart the pleasant land shall soon quit the earth and depart to his own place in the cold void of history. His habits are not new. Two hundred years ago we saw the work of the Hun in Scotland. You know him as the Duke of Cumberland. By common consent we still describe him as the "Butcher." But we, for our good, are reviving amongst us certain primitive truths: that a nation cannot exist which is detached from the soil, and that the perpetuation of the Race depends upon the primitive in Woman.

Mistrust, then, your lesser intellectual breeds: your young Byrons who cursed when Waterloo was won, your young Wordsworths who cast up the red caps of Revolution, as many in these days are casting up their caps too soon. Mistrust your "intelligentsia," mere bores and busybodies, who seize the moment to put into effect their vagaries. A nation governed entirely by the paid leaders of men who work with their hands may prove to be no more desirable than a nation governed by men who trust in their sword arm alone. To exchange a military union for a trade union is to exchange thongs for scorpions. Depend upon the safe, solid sense which you have inherited from your fathers. These are no times for experiments. We have been saved in former times, and we shall be saved again if we put our trust in the old, unaltered blood, in the passion, the piety, and the prowess of the line.

You have heard it said that all great wars in the past were religious wars. This, too, is a religious war—against the calculated atheism which would make of religion a speculative department within the bounds of the scientific spirit. This is the spirit against which the mediæval church continually strove by persuasion, remonstrance, and cursing, and finally called to its aid the secular fire and sword. The church with profound instinct discovered the tendency which would inevitably produce a race of logical German ultra-Protestants of which the Fathers prophesied. It may, indeed, be that the German has lost his soul; for races, nations, and men do arrive at a point where they have no soul to save.

I think that this class of intelligentisia has been worse infected, and has done more than any other to spread the Germanic virus. Even in the universities the "German-trained" scholar was the thing, and in those doubtful, early August days their influence was against the instincts of the people. Quite recently I heard one of them say that he considered the German method for disposal of their dead "extremely sensible."

When I came overseas, I called upon one of these "scientists," and he could not restrain his astonishment over the queer garb I wore. He asked me the meaning of it. I did not tell him. He would not understand. In a place so remote that many of you have never heard its name the alarm of war reached us 24 hours after it had sounded. A boy was sitting beside me reading a book. He laid down the book and walked a little way. I picked it up and read:—

> "It is not to be thought of that the flood
> Of British freedom which to the open sea
> Of the world's praise from dark antiquity
> Hath flowed with pomp of waters understood—
> That this most famous stream in bogs and sands
> Should perish, and to evil and to good
> Be lost forever."

The boy came back and said, "I think I will go to the war." "To-night or in the morning?" I asked. "In the morning," he said. He went away in the morning. I saw him next in Plug Street Woods. A little child does sometimes lead safely.

In the absence of your soldiers keep the national emblems bright. Keep the fountain of honour undefiled. The majesty of the King appeals with peculiar intimacy to all who can claim the northern kingdom for their home, or the home which their fathers left to adventure over other seas. By nature we are Royalists, and upon this matter we are not likely to suffer from false illusion. The Crown has become the seal and bond of Empire. We from over-seas are not especially enamoured of your Houses of Parliament or of our

own either; and, if we can believe what we hear, you yourselves have no great pride in them. These Houses would do well to remember that there is always an appeal to the King, and when such an appeal is made by men accustomed to arms it is likely to be irresistible.

What love we have lost for Parliament we have reserved for our King. A soldier's love for his King is a passion in itself as profound in nature as the love of man for woman. It is only measured by the degree to which the soldier himself is kingly. No soldier will ever forget the day when the King rode athwart our closed columns and looked into one's eyes with his lovely Stuart eyes. He is the final human being to whom the humblest soldier may make appeal. This instinct of the soldier of our race, that even in this world in the person of the King lies an abode of justice and mercy, is as ineradicable as the instinct which impels men of every age and race to lift beseeching hands to Our Father which art in Heaven.

Reflections
ON THE
LIMITATIONS OF VACCINE TREATMENT.[1]

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IT is my aim this evening to sketch very briefly the place that vaccines should take in therapeutics, and to consider what may fairly be expected of vaccine treatment and what are its limits. I am aware that the observations I have to make are obvious and even commonplace, but I have often heard them overlooked both in public discussion and in private conversation.

THE DIFFICULTY IN ESTIMATING THERAPEUTIC RESULTS.

It is notorious that no judgment in medical practice is more difficult than the estimation of the value of a particular method of treatment. A new method is introduced, it wins a certain amount of favour, it may become the fashion, and unless it is accompanied by some obtrusive disadvantages or dangers, many of us are convinced that the treatment is, if not "the last word," at least "a distinct advance," and we go on with it until a new fashion takes the place of the old. Our reasoning on these matters is never logical, and rarely individual. We are governed by laws—if they be laws—of herd psychology. Our conclusions are instinctive, not conscious.

This is, in part, due to the difficulty of forming a judgment of cause and effect in a highly complex set of phenomena. It is difficult or impossible to arrange a therapeutic experiment in such a way that the conclusion is irresistible. The problem is not so complicated in surgical as in medical treatment, as the conditions more closely approach those of scientific experiment. Nevertheless, surgeons are not free from the influence of fashion—that is to say, from the sway of inaccurate judgment. Gastro-enterostomy, appendicectomy, colectomy, Jackson's membrane, have all had their vogue, and the nuciform sac is not the exclusive specialty of an imaginative surgeon.

In every branch of medicine we meet this difficulty of estimating therapeutic results, but in the case of vaccines the difficulty has been increased by certain more or less accidental circumstances. Vaccine treatment came to us as a gift from the laboratory. It came, therefore, with a certain scientific pedigree which demands for it our consideration, but it is often presented by men trained in laboratory methods, without clinical experience, and without the knowledge necessary for the comparison of therapeutic results. On their side, clinical workers, being unfamiliar with the technique of vaccines, have been content to leave their administration to those who were. It has come about, therefore, that for years, and, indeed, to a certain extent to the present day, vaccine treatment has remained in the hands of men of laboratory training. It is, however, clinical experience, and that only, that can seal its value.

[1] An address delivered before the Section of Medicine, Royal Academy of Medicine in Ireland.

The enthusiasm of the introducers of vaccine treatment—an enthusiasm often untempered by clinical experience—has put forward somewhat extravagant claims. These claims, misunderstood and misrepresented, led the optimistic to expect miracles. But miracles do not happen, and those who were disappointed, on the one hand, and, on the other, those who had their prophesyings of evil accomplished, agreed to declare that they had been hoaxed. The number of successes, however, was sufficient to keep up some belief in the miracles, and between the faithful and the sceptic there seemed to be no common ground. Certain trading firms saw their opportunity, and by making impossible claims for inferior products caused both disappointment and disgust. In short, an abnormal state of mind was produced which has prevented the profession exercising a normal judgment.

We have, however, passed through both elation and depression, and we are, I hope, now in a position to judge coolly of the rightful place of vaccines in treatment.

PREVENTIVE INOCULATION.

First, as regards their place in preventive medicine. The experience of the present war puts beyond all question the value of preventive inoculation against the enteric diseases. Our troops have been inoculated against typhoid, but not at first against paratyphoid. We know how rare has been typhoid, although paratyphoid, hitherto regarded as a rare disease, has been in some areas by no means uncommon. Yet medical officers from most of the fronts have made us familiar with the insanitary conditions under which the men have to live and of the gross contamination to which much of the drinking water is subject. If our troops had to rely merely on sanitary precautions in the ordinary sense and were not protected by inoculation there does not seem to be any reason why they should not suffer from disease as troops suffered in South Africa and in most other campaigns in history.

In our ordinary home-medicine we have also experience of the efficacy of preventive vaccination, particularly in the results of inoculation against recurrent catarrhs of the respiratory organs. The problem is more complicated than in the case of typhoid in that we are dealing with infections by organisms with which we are not so familiar and, moreover, we are dealing not with a single organism, but with several, out of which it is a matter of difficulty to select the main infective agent. We have not, therefore, as good a record of success as in inoculation against enteric, but, nevertheless, successes are sufficiently numerous to justify us in the hope that with a more intimate knowledge of the bacteriology of the respiratory tract, and more particularly with the development of knowledge of a correlation between the different forms of respiratory catarrh and different species of bacteria, we may soon be in a position to judge what class of cases may be satisfactorily treated and what class we cannot expect to influence. It must not be forgotten that the attacks of some diseases, of which the best example is perhaps influenza, do not appear ordinarily to confer immunity, or at any rate an immunity which persists for any length of time. In the case of such diseases we are not likely to produce any persistent effect by preventive inoculation.

VACCINE TREATMENT: ACTION AND LIMITATIONS.

I have dealt with the question of preventive inoculation first for two reasons. In the first place, the claims made for vaccines are admitted. But, in the second, the consideration of the prevention of disease by immunisation helps us to understand what we have a right to expect from vaccines in curative treatment. Active immunisation is the training and marshalling of the protective forces of the body against a particular kind of attack. That is to say, it is an attempt to stimulate a natural process—the process by which the body naturally defends itself against bacterial invasion.

A vaccine is not a new ally in the fight between the parasite and the host, assisting the latter to destroy the former. It is only a stimulus to the body to exert to the full its natural powers of resistance and protection. Of itself it can do nothing. Although, then, one rightly speaks of vaccine treatment as specific, it is specific in quite a different way from the so-called specific action of drugs. We suppose quinine to be specific for malaria, and arsenic or mercury for syphilis, because we believe the drug in each case to exert a

special destructive action on the infecting parasite. But vaccines are only active against bacteria mediately in that they stimulate the production of bodies which possess special destructive powers toward particular organisms. Vaccines are, therefore, in a sense only specific at second-hand.

As the action of vaccines is merely stimulative of certain natural powers of the body, it is clear that if the body is already exhausted, if it is no longer able to produce the substances, the vaccine fails. Moreover, in cases where it does not fail, its success is proportional to the power of the tissues to respond to its call. To expect uniform success from vaccines is therefore as unreasonable as to suppose that the body can never fail in its defence against attack.

It follows that the cases in which we may expect the best results of vaccine treatment are those in which (1) the body has not yet lost its natural power of resisting infection, and (2) in which there has not been great tissue change. If the body has no power of resisting infection the vaccine is quite inert. It is as useless as a trumpet-call in a deserted barrack-square. It is not possible to tell whether such cases really occur, nor how to recognise them if they do. We must, however, be prepared to meet them and not to be disappointed if the inevitable happens.

The second qualification is of more practical interest. When grave tissue changes have taken place we cannot hope by any method of treatment either to restore lost tissue or to cause the absorption of masses of new tissue of a degenerate order. Vaccines can only produce a resistance to an infective process—they have no effect in dealing with the results of that process after the process has ceased. I do not suggest that there are not other agencies in the body at work to restore damaged tissue to the normal, but these agencies are neither helped nor hindered by vaccines. Let me take one example:—

A Fallopian tube becomes infected by, let us say, the gonococcus and suppuration follows. While the infection lasts, its progress may be hampered or prevented by vaccine treatment. But once the gonococcus loses its vitality, vaccines give no help to the tissues in their struggle to return to the normal. Neither will vaccines cure a stricture of the urethra consequent on gonorrhœa. This is so obvious as to appear commonplace. But let us supply the same reasoning to the effects of rheumatic infection, whether on the joints or on the valves of the heart. We may reasonably hope to hamper the progress of rheumatic injury or to arrest it altogether. But if gross tissue changes have occurred, they cannot be repaired by vaccines. It would be as reasonable to suppose that, if the invaders were to-morrow driven from the fields of Flanders, those fields would be restored forthwith to the condition in which they were three years ago. The battle may be over, and the invaders destroyed, but many of the traces of battle are ineradicable, while others will persist for years. Louvain and Ypres will never be again what they were three years ago. Neither will the heart valves that have been eroded and fibrosed in the battle between the infecting cocci and the protective agencies of the body be the same again.

Scope of Vaccine Treatment.

The question is not infrequently asked, What class of diseases should vaccines be employed in? The answer, bearing in mind the limitations I have already suggested, is, Every infective disease due to bacterial origin in which the bacterial cause can be discovered. The acuteness or chronicity of the condition is beside the point, though it may have much to do with the method of administration. A similar remark applies to the question whether the disease is general or local. In every case where a fight is going on between the body and an invading bacterium there is reasonable hope that the defensive forces will be strengthened by the administration of a vaccine. But, as vaccines are specific, a correct bacteriological diagnosis is necessary. In this vaccines are at a distinct disadvantage if contrasted with other methods of treatment. By rest, suitable food, good nursing, and relief of unpleasant symptoms we cure, or rather assist nature to cure, many of our patients. If before treating them an accurate diagnosis were necessary how many successes would we have? But if vaccines are to have any effect at all their use must be preceded by correct diagnosis. We must be sure that we are treating with the infecting organism. Of course, if the infection be mixed, as is so often the case, we must often be content to treat with a group of organisms—i.e., with a mixed vaccine—being assured that at least one element in our vaccine is specific for the infection, and that the others, if not helpful, are at least harmless.

No greater misconception can exist than the notion that vaccine treatment is incompatible with the use of other methods of treatment. On the contrary, one rarely gets the best results from vaccine treatment unless one makes full use of whatever concomitant measures his own experience or the accumulated experience of others may suggest. Few drugs are in any way inimical to the action of vaccines, and those that are, are depressant to the natural resistive powers of the body, and are therefore contra-indicated in the class of diseases in which vaccines are employed. Of these the only drug in common use is alcohol, the employment of which in septic diseases should by now be obsolete except under rare conditions. Vaccine treatment, therefore, goes side by side with treatment by drugs.

In surgical conditions, operative measures, or anything else that surgical knowledge suggests should, of course, be practised when required. The only precaution to be observed is to withhold inoculations in immediate proximity to any manipulative proceeding which may gives rise to auto-inoculation. Otherwise vaccines, of course, act in their normal manner of increasing the protective power of the body.

I said at the beginning that much misjudgment of vaccine treatment by the profession has been due to the treatment being so largely committed to men unaccustomed to clinical work. It cannot, however, remain in the hands of a special class. As an important branch of therapeutics it must become familiar to every practitioner. No student can be considered to have gained a sufficient knowledge of therapeutics who has not become familiar with both the doctrine of immunity and the practice of immunisation. In this way vaccine treatment will come to take its proper place—not as something peculiar and special, but as an essential part of the treatment of infective disorders of bacterial origin.

Dublin.

A VARIETY OF

WAR HEART

WHICH CALLS FOR TREATMENT BY COMPLETE REST.

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Two chief factors are concerned in bringing about the heart troubles of soldiers. One of these, the physical and emotional strain of military life, has attracted much attention since the war began, and the group of symptoms named by Dr. T. Lewis and his fellow-workers the "effort syndrome" has been treated of by many medical writers. The second factor, the temporary weakening of the heart muscle by campaign diseases, has received much less notice.

Among soldiers of the Mediterranean Forces the effort syndrome has been as much in evidence as on the Western front, but we have also seen very many cases in which malaria and some in which other epidemic diseases, such as dysentery and trench fever, have left the myocardium damaged for a time.

It is the aim of this note to call attention to these cases and to emphasise the fact that treatment by graduated exercises, which has proved so useful in the differentiation and cure of the functional cases, is unsuitable and *does actual harm* in the organic cases, so long as the physical signs of damage to the heart muscle persist.

The symptoms described by the patients are shortness of breath on exertion, inability to walk any distance, and, in some cases, præcordial pain. The physical sign is an extension of the cardiac dullness towards the right, often to 1½ or 2 inches beyond the mid-sternal line. Only in extreme cases is there any conspicuous extension towards the left. The dull area has a clearly defined outline, and yields a sense of resistance on percussion. The resistance can also be appreciated by dipping, with the pads of the fingers, along the course of the ribs or intercostal spaces. This method of palpation was taught me, years ago, at the Hospital

for Sick Children, by an American friend and pupil, Dr. T. Wood Clark, and I am convinced that, as a means of marking out the cardiac area, it supplies a valuable control to percussion. It is better to mark out the area by palpation first, and to check the findings by percussion.

I am well aware that some physicians, whose opinions are entitled to all respect, deny the possibility of determining the right border of the cardiac area by percussion, let alone by palpation, but this is wholly at variance with my experience. Many of us working in association here (as previously in England) have examined cases and have checked each other's findings, with open eyes and blindfold. We have agreed in our markings, have watched the drawing-in of the area of dullness under treatment, and its re-expansion after renewed strain or relapses of malaria, and are confident of the correctness of our observations. My colleague, Colonel H. H. Tooth, allows me to quote him as endorsing this statement. Murmurs are not often heard in the cases under discussion, and when present are of the functional kinds, so common in soldiers. The patients are many of them anæmic, but there is no obvious relation between the degree of anæmia and the increase of the cardiac area. Their blood pressure is often above the normal for their ages, as is usual in soldiers who have recently been on active service, and often fluctuates widely with position, emotion, or exercise. The great majority are of the younger military ages.

The signs described are such as my late colleague, Dr. D. B. Lees, taught us to look out for in rheumatic children, in whom the enlargement of the cardiac area, ascribed to myocarditis, often precedes any indication of endocardial lesion.

The X ray shadow of a normal heart extends some way beyond the right border of the sternum, and the right auricle, to which this shadow is mainly due, is covered by the edge of the lung. Extension of the cardiac dullness to the right must indicate a pushing aside of the lung and the bringing of a larger area of the heart's surface into direct contact with the chest wall. My assistant, Major G. Graham, has pointed out that the abnormal dullness is abolished when the patient draws and holds a deep breath. Presumably the dullness results from dilatation of the auricles, especially of the right auricle, and it does not necessarily follow that such dilatation will cause a conspicuous extension of the cardiac shadow. Major Graham is making a series of accurate measurements of the shadows of such hearts and of normal controls. His results, which are as yet incomplete, will be recorded by him in due course.

We have had opportunities of watching the effects of various treatments in these cases of post-malarial dilatation, and in one of our military hospitals wards have been set apart for them under the care of Dr. Prudence Gaffikin. It is to be hoped that she will publish an account of her results later on, and it is only necessary to give a few general conclusions in this note.

Our experience has convinced us that the fitting treatment for such patients is complete rest until the cardiac dullness has returned to its normal limits and for at least a week afterwards. The hearts of many patients which have not responded to modified rest have come in after complete rest has been imposed. The patient is not allowed to rise from his bed for any purpose, nor even to sit up in bed for his meals, nor is he permitted to smoke. We have seen patients who have been treated by exercises *ab initio*, and others who have been allowed up after a short period of rest, although their hearts were still dilated. Neither plan has anything to recommend it, and the results have been wholly unsatisfactory. When the dilatation is recent the cardiac area may return to its normal limits within as short a period as a week. In cases of longer standing, in which rest has not been imposed at the outset, longer periods, up to six or eight weeks, have been required. In no case has the heart failed to come in sooner or later.

In Dr. Gaffikin's wards the patients have begun gentle resistance exercises in bed 10 days after the cardiac dullness has come in. Then follow graduated exercises in the erect posture, and, if all goes well, they are sent to a convalescent camp, where the exercises are continued, under careful medical supervision, in an organised heart clinic.

As a rule, under such treatment, the heart does not re-dilate. If the area of dullness should again spread to the right a further period of rest is imposed. In some cases a relapse of malaria has caused a return of the signs, even during the period of complete rest. A few patients show a great liability to repeated re-dilatations under very slight provocations—a condition for which the apt nickname of "concertina heart" has been coined. Drugs play a comparatively small part in the treatment. Some of us advocate digitalis, and others nux vomica, but I am not convinced of the efficacy of either. Major Graham believes that digitalis lessens the chance of re-dilatation.

To sum up, the "soldier's heart" is not a clinical entity, but includes a variety of morbid states. Even amongst those patients who exhibit what is called the "effort syndrome," some respond well to exercises and others do not, and it is one of the chief claims of the exercises that by their means we are able to sort out the fit from the unfit. Again, as I have tried to show, we meet, in the course of our military work, with cardiac troubles in the treatment of which the most important factor is rest.

Malta.

AN ANALYSIS OF CASES OF TETANUS TREATED IN HOME MILITARY HOSPITALS

DURING AUGUST, SEPTEMBER, AND PART OF OCTOBER, 1916.

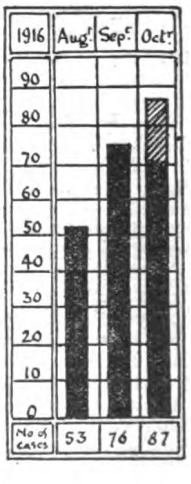
BY SIR DAVID BRUCE, C.B., F.R.S., F.R.C.P.,
SURGEON-GENERAL, ARMY MEDICAL SERVICE.

TWO analyses of cases of tetanus treated in home hospitals have been published in THE LANCET—one on Oct. 23rd, 1915, the other on Dec. 2nd, 1916. This paper continues the subject, and gives an analysis of the cases which occurred in August, September, and part of October, 1916. During this time reports on 200 cases have been received; of these, 127 recovered and 73 died—a mortality of 36 5 per cent.

In the first analysis there were 231 cases, with a mortality of 57·7 per cent.; and in the second 195 cases, with a mortality of 49·2 per cent. This shows a regular and satisfactory fall in the rate of mortality, which it is hoped will continue until the 20 per cent. aimed at is attained. This fall is probably due to the introduction of the primary prophylactic injection of antitoxin, and also to the earlier diagnosis and earlier specific treatment of the disease. If the fall continues it will depend on the introduction of multiple prophylactic doses, the vigilance of nursing sisters in detecting early symptoms, and the prompt and thorough treatment by medical officers by means of antitoxin.

It had been intended to give an analysis of cases of tetanus treated in home hospitals at the end of each year of the war. Now it is thought better to give one at more frequent intervals. This is due to the great interest taken in the subject by medical officers in charge of wounded at home. It ought to conduce to the keeping up of this interest if the results of new recommendations made by the Tetanus Committee be reported on at more frequent intervals than one year. In fact, the intention at present is that in future each series of 100 cases as they are completed will be shortly reported on.

DIAGRAM 1.



During the same time two analyses have been published by Colonel Sir William Leishman on the cases of tetanus occurring among the British troops in France. In the first, 179 cases were dealt with, with a case mortality of 78·2 per cent. In the second, in collaboration with Major A. B. Smallman, 160 cases were analysed and gave a case mortality of 72·7 per cent. The cases dealt with in France are naturally more acute and severe than the cases which arise in England.

THE DISTRIBUTION OF CASES OF TETANUS DURING AUGUST, SEPTEMBER, AND OCTOBER, 1916.

Diagram 1 represents the number of cases which occurred in each month. Sixteen of the cases which occurred at the end of October do not come into this analysis. The diagram

merely gives the number of cases which were treated in home hospitals during each month and has no relation to the number of wounded.

RELATION OF THE NUMBER OF DAYS WHICH ELAPSED BETWEEN THE DATE OF WOUND AND THE ONSET OF SYMPTOMS AND THE RATE OF MORTALITY.

Diagram 2 shows that in the cases dealt with if the symptoms of tetanus appeared within ten days of receiving the wound the mortality was 42 3 per cent. ; if between the eleventh and twenty-fifth day, 36 9 per cent.; the remaining 67 cases, with an incubation period of from 26 to 365 days, 25·3 per cent. This shows an all-round improvement.

THE INCUBATION PERIOD, OR NUMBER OF DAYS WHICH ELAPSE BEWEEN THE DATE OF WOUND AND THE ONSET OF TETANUS SYMPTOMS.

Curve A shows the number of cases which occurred on each day after the date of the wound. The shortest period of incubation was three days and the longest 365. More cases occurred on the ninth, eleventh, and fourteenth days than on any other. There were only 26 cases with a short incubation period—that is, up to 10 days, and 78 cases with an incubation period of more than 22 days. This is very much the same as in the preceding year—27 and 62—which is to be expected since the regulations concerning prophylactic injections were the same in both years. It is the prophylactic injection which governs the incubation period.

It will be interesting to see what effect a second, third, or more prophylactic injections will have on this incubation period. This new recommendation was made by the Tetanus Committee at the beginning of November, 1916. It is sincerely to be hoped that medical officers in charge of wounded will give this new recommendation a fair trial.

THE POSITION OF THE WOUNDS IN REFERENCE TO THE MORTALITY.

It was noted by Sir William Leishman and Major Smallman that a fatal issue is more common when the body, as distinguished from the limbs, has been wounded. Table I. gives the position of the wounds in the 200 cases under consideration. One case had no perceptible wound.

TABLE I.

—	Body.	Limbs.
Fatal, 72 cases	23 (31·9 °/₀)	49 (68·1 °/₀)
Recovered, 127 cases	48 (37·8 °/₀)	79 (62·2 °/₀)

Note.—When wounds occurred both on the body and the limbs the case is counted only under the heading "Body."

From the above table it would appear that wounds involving the limbs are more dangerous than those involving the trunk.

THE EFFECT OF FRACTURES ON THE RATE OF MORTALITY IN CASES OF TETANUS.

Among the 200 cases under consideration there were 73 fractures—36 per cent. of the whole. Of these, 51 recovered and 22 died ; mortality, 30·1 per cent.

Among the 200 cases there were 127 cases without fracture. 77 recovered, 50 died ; mortality, 39·3 per cent.

TETANUS OCCURRING AFTER OPERATIVE INTERFERENCE WITH THE WOUND.

Table II. gives the cases, 17 in all, in which tetanus is reported to have followed on an operation. There were 14 recoveries and 3 deaths, a mortality of 17·6 per cent. In not one of these cases was a prophylactic dose of antitoxin reported to have been given at the time of the operation—in spite of the recommendation of the Tetanus Committee in their memorandum of August, 1916.

DIAGRAM 2.

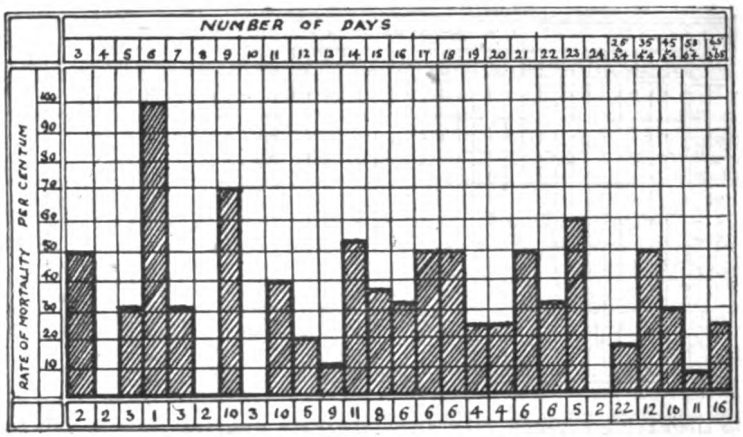


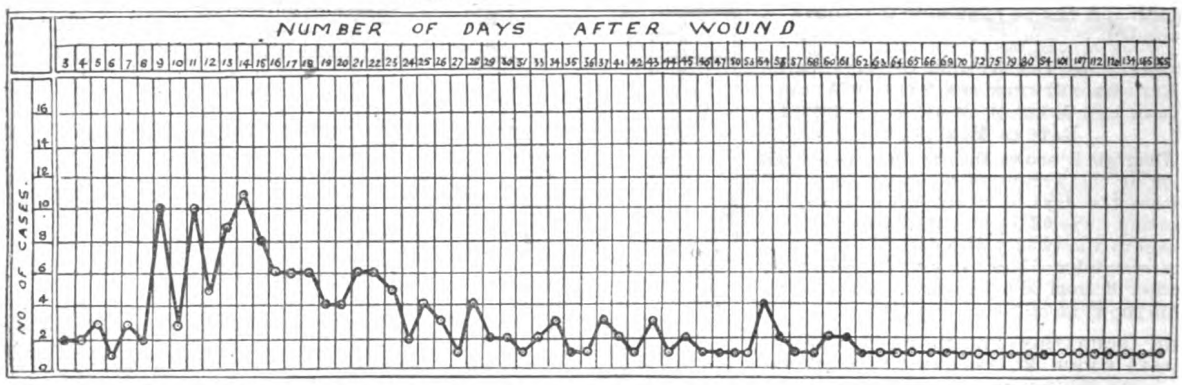
TABLE II.

No. of case.	Date of wound.	Date of operation.	Date of tetanus.	Days after wound.	Days after operation.	Nature of wound.	Nature of operation.	Recovered.	Died.
	1916.	1916.	1916.						
416	15-7	29-7	6-8	22	8	R. leg below knee.	Artery ligatured.	R	—
417	20-7	29-7	3-8	14	5	L. buttock.	Shrapnel removed.	R	—
447	1-7	17·8	31-8	61	14	Shell wound, forearm.	Shell removed.	R	—
456	18 7	30-7	15-8	28	13	Shoulder, arm, hand.	Shrapnel removed.	R	—
490	18-8	18-9	30-9	43	12	Thigh.	Reamputation.	R	—
505	6-5	9-10	13-10	160	3	R. shoulder.	Aneurysm.	—	D
510	20-9	3-10	19-10	29	16	L. mastoid and elbow.	Shrapnel removed.	R	—
540	27-8	19-9	20-9	24	1	L. calf and foot ; fracture.	Foot opened up.	R	—
543	3-10	30-10	31-10	28	1	R. arm, radius, & ulna fractured.	Arm put in new splint.	—	D
555	18-8	6-9	14-9	27	8	Back, arms, L. leg, and foot.	Foot opened up.	R	—
566	21-8	7-9	20-9	30	13	Shell, both legs.	Reamputation.	R	—
576	8-9	22·9	23-9	15	1	L. buttock.	Bullet removed.	R	—
584	6·7	25-7	4-8	30	10	R. leg.	Amputation.	R	—
597	19-8	4-9	9-9	21	5	L. arm, R. thigh.	Secondary hæmorrhage.	—	D
598	25-7	17-8	20-8	26	3	Ribs injured.	Metal removed.	R	—
655	28-8	18-10	21-10	54	2	Thigh amputated.	Began to discharge.	R	—
659	13-8	4-9	7·9	25	3	L. leg, comp. fract. tibia.	Amputation.	R	—

TABLE III.

No. of case.	Date of tetanus.	Date of operation.	Days before operation.	Nature of wound.	Nature of operation.	Recovered.	Died.
	1916.	1916.					
439	29-8	29-8	0	Fract. skull, R. leg, arm, 2 other wounds.	Wounds opened up.	—	D
451	29-8	29-8	0	Scalp, chest, and arms.	Scalp wound opened up.	R	—
456	15-8	15-8	0	Shoulder, scapula region, & upper arm.	Shrapnel removed.	R	—
457	30-8	4-9	5	Comp. fracture humerus.	Dead bone removed.	R	—
460	14-9	16-9	2	L. thigh and knee.	Metal removed.	—	D
461	20-9	20-9	0	L. hand and arm, both thighs.	Flint removed ; abscess opened.	R	—
466	22-9	22-9	0	R. knee, leg, and L. buttock.	Knee opened.	—	D
484	11-7	12-7	1	Both legs and hands.	Soil removed.	R	—
533	30-10	31-10	1	R. thigh, comp. fracture.	Necrosed sequestrum removed.	R	—
548	16-9	20-9	4	Arms, legs, and scalp.	Thigh wounds opened up.	R	—
560	2-9	6-9	4	L. arm, R. thigh and shoulder.	Shrapnel removed.	R	—
622	16-10	22-10	6	Scalp.	Opened.	R	—
651	15-9	16-9	1	Face and fracture L. forearm.	Bone removed from arm and jaw.	R	—
742	1-8	5-8	4	R. arm, shoulder, loin, back, knee, and foot.	Shell and khaki removed.	—	D
753	30-9	30-9	0	Fractured humerus.	Moved ends of bone.	R	—

CURVE A.



ON OPERATIVE INTERFERENCE AFTER TETANUS SYMPTOMS HAVE APPEARED.

Table III. gives the cases, 15 in all, in which an operation was carried out on the wound after the appearance of symptoms of tetanus. There were 11 recoveries and 4 deaths, a mortality of 26·6 per cent. Last year the mortality in such cases was 47·6 per cent. From this year's figures there would appear to be no marked danger in operating after the appearance of tetanic symptoms. Until more evidence has accumulated the advice still holds of waiting until the tetanus has been got under control, and the blood and tissues flooded with antitoxin before undertaking any drastic interference with the wound.

TREATMENT OF TETANUS BY ANTITETANIC SERUM.

A. Prophylactic or Preventive Treatment.

Among the 200 cases, 102 are noted as having received a prophylactic injection of antitoxin in France immediately after being wounded. Only 3 cases are reported to have received prophylactic injections in home hospitals.

Of these 102, 74 recovered and 28 died, giving a mortality of 27·4 per cent. Of the remaining cases, there is no record of prophylactic treatment in 87, although in all probability most of them received it. Of these 87, 48 recovered and 39 died, a mortality of 44·8 per cent. The remaining 11 cases are stated to have had no prophylactic injection of any kind. Of these, 5 recovered and 6 died, a mortality of 54·5 per cent.

In regard to the question as to what influence time has in these primary prophylactic injections, the following table gives all the information available:—

TABLE IV.

—	Recovered.	Died.	Per cent.
72 cases inoculated on day of wound	50	22	30·5
18 ,, ,, one day after wound	15	3	16·6
6 ,, ,, two days after wound	6	0	—
1 case ,, three ,, ,,	0	1	—
2 cases ,, four ,, ,,	1	1	—
1 case ,, five ,, ,,	1	0	—
1 ,, ,, six ,, ,,	1	0	—
1 ,, ,, seven ,, ,,	0	1	—

Of the 72 cases inoculated on day of wound the average incubation period was 29·5 days. Of the 11 cases which received no prophylactic inoculation the average incubation was 15 7 days.

B. Therapeutic or Curative Treatment.

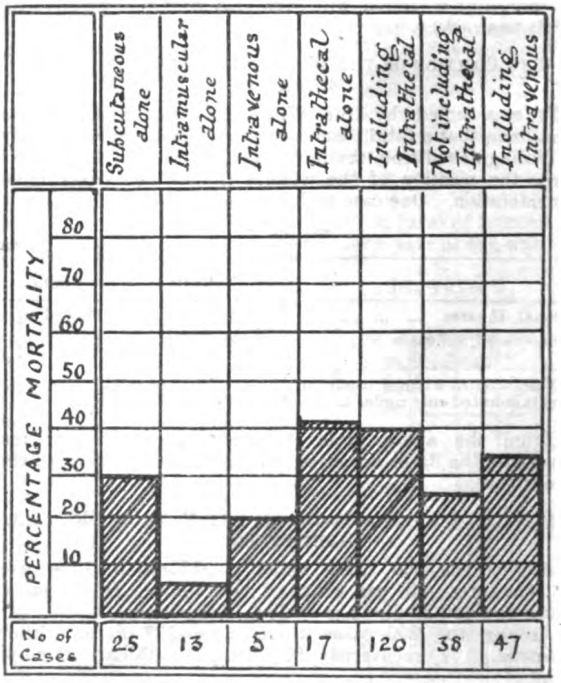
Out of the total of 200 cases the number treated with antitetanic serum after the onset of symptoms was 198 (99 per cent.). Two cases did not receive therapeutic treatment with antitetanic serum in England; both died. There is no record that either of these men received a prophylactic injection in France. One of them, Private W. H., showed symptoms of tetanus at 1 P.M. on Sept. 17th, 1916, and died at 8.40 A.M. on Sept. 19th. The other, Private L. K., showed symptoms on Sept. 25th, 1916, and died four days later. No reason is given in either case why specific treatment was not used. Of the 198 cases which received serum treatment 127 recovered and 71 died. Mortality, 35·8 per cent.

ON THE INFLUENCE OF ROUTE IN THE INJECTION OF ANTITETANIC SERUM.

Of the 198 cases—	Per cent.
25 were treated by subcutaneous injections alone: recovered, 8 died. Mortality	32·0
13 were treated by intramuscular injections alone: 5 recovered, 1 died. Mortality	7·7
were treated by intravenous injections alone: 4 recovered, 1 died. Mortality	20·0
17 were treated by intrathecal injections alone: 10 recovered, 7 died. Mortality	41·2
There were 120 cases which included intrathecal injections: recovered, 48 died. Mortality	72 40·0
There were 38 cases which did not receive intrathecal injections: 28 recovered, 10 died. Mortality	26·3
There were 47 cases which included intravenous injection: recovered, 16 died. Mortality	31 34·0

It would appear from Diagram 3, which represents this graphically, that no advantage in favour of intrathecal injections emerges from these figures, as seemed to be the case in 1915.

DIAGRAM 3.



IS THERE ANY OTHER EVIDENCE TO BE FOUND IN THESE REPORTS THAT THE INTRATHECAL ROUTE HAS ANY ADVANTAGE OVER THE OTHER METHODS OF INJECTION?

Treatment Beginning on Day of Onset of the Disease.

	Per cent.
During the period August-October, 1916, 96 cases were treated with antitetanic serum on the day the symptoms declared themselves. 54 recovered, 42 died. Mortality	43·7
Out of the 96 cases the following received antitoxin, but not intrathecally, on the day of the disease: 43 cases; 26 recovered. 17 died. Mortality	39·5

Out of the 96 cases the following received antitoxin intrathecally on the day of onset of the disease: 53 cases; 28 recovered, 25 died. Mortality ... ... 47·1

Treatment Beginning on the Day following the Onset of Disease.

During this period 38 cases were treated with antitetanic serum beginning one day after the symptoms had declared themselves. 27 recovered, 11 died. Mortality ... ... 28·9

Out of the 38 cases the following received antitoxin, but not intrathecally, one day after the onset of the disease: 23 cases; 17 recovered, 6 died. Mortality... ... ... 26·0

Out of the 38 cases the following received antitoxin intrathecally one day after the onset of the disease: 15 cases; 10 recovered, 5 died. Mortality ... ... 33·3

Treatment Beginning Two Days after the Onset of the Disease.

During this period 27 cases were treated with antitetanic serum beginning two days after the symptoms had declared themselves; 18 recovered, 9 died. Mortality... ... ... 33·3

Out of the 27 cases the following received antitoxin, but not intrathecally, two days after the onset of the disease: 10 cases; 7 recovered, 3 died. Mortality ... ... 30·0

Out of the 27 cases the following received antitoxin intrathecally two days after the onset of the disease: 17 cases; 11 recovered, 6 died. Mortality... ... ... 35·3

Treatment Beginning Three to Twelve Days after the Onset of the Disease.

During the same period 36 cases were treated with antitetanic serum beginning three to twelve days after the symptoms had declared themselves. 25 recovered, 11 died. Mortality 30·5

Out of the 36 cases the following received antitoxin, but not intrathecally, three to twelve days after the onset of the disease: 10 cases; 6 recovered, 4 died. Mortality 40 0

Out of the 36 cases the following received antitoxin intrathecally three to twelve days after the onset of the disease: 26 cases; 19 recovered, 7 died. Mortality ... ... 26·9

Last year (1915–16) the difference was in favour of the intrathecal route. Now the opposite is true. From these figures it would appear that it is better to defer treatment until the symptoms have been manifest for one or more days. *Quod est absurdum.*

THE INFLUENCE OF DOSAGE ON THE CURATIVE ACTION OF ANTITETANIC SERUM.

(*a*) *The Total Quantity of Antitoxin Given During the Attack.*

Out of the 198 cases—							Per cent.
3	received	1000 units or under:	2	recovered,	1	died. Mortality	33·3
32	,,	1,001 to 5,000 units:	16	,,	16	,, ,,	50·0
25	,,	5,001 ,, 10,000 ,,	14	,,	11	,, ,,	44·0
24	,,	10,001 ,, 15,000 ,,	15	,,	9	,, ,,	37·5
20	,,	15,001 ,, 20,000 ,,	11	,,	9	,, ,,	45 0
27	,,	20,001 ,, 30,000 ,,	18	,,	9	,, ,,	33·3
10	,,	30,001 ,, 40,000 ,,	5	,,	5	,, ,,	50 0
31	,,	40,001 ,, 60,000 ,,	24	,,	7	,, ,,	22·5
21	,,	60,001 ,, 100,000 ,,	18	,,	3	,, ,,	14·3
5	,,	100,001 ,, 481,000 ,,	4	,,	1	,, ,,	20·0

(*b*) *The Daily Quantity of Antitoxin Given.*

Out of the 198 cases—							Per cent.
6	received	100 units or under:	5	recovered,	1	died. Mortality	16.6
103	,,	1001 to 5000 units:	67	,,	36	,, ,,	35 0
47	,,	5001 ,, 10,000 ,, :	33	,,	14	,, ,,	29·8
19	,,	10,001 ,, 15,000 ,, :	10	,,	9	,, ,,	47·0
9	,,	15,001 ,, 20,000 ,, :	4	,,	5	,, ,,	55·5
8	,,	20,001 ,, 30,000 ,, :	5	,,	3	,, ,,	37 0
4	,,	30,001 ,, 40,000 ,, :	2	,,	2	,, ,,	50·0
2	,,	40,001 or more ,, :	1	,,	1	,, ,,	50·0

From these figures relating to dosage no useful deduction can be made. The only excuse for including them is to enable a comparison to be made, with the amount of serum given in the period August, September, and October, 1916, with that given in 1914–15 and 1915–16.

Remarks on the Therapeutic Value of Tetanus Antitoxin.

This section on the prophylactic and therapeutic action of antitoxin may be concluded with the following criticism. To begin with it is quite evident that no advance in our knowledge of the curative value of tetanus antitoxin can be made from these new figures.

In the two previous analyses it was stated "the main conclusion to be drawn from a study of these cases of tetanus treated therapeutically by antitetanic serum is that it seems highly probable that the serum has little or no effect on the course of the disease." This, of course, must be understood to be merely an opinion formed from the study of these particular figures. It is not the expression of an opinion as to the usefulness or not of antitetanic serum as a therapeutic agent. It merely means that no evidence can be gained from these reports in favour of the curative power of this antitoxin. This is not to be wondered at. The number of cases analysed is small. There are only two controls. The greatest variety in mode of treatment exists. The men are suffering from wounds, septic poisoning, and other diseases in addition to tetanus. The cause of death is credited to tetanus, but in many cases wrongly so. For example, among the 73 deaths in the 200 cases under consideration, 14 at least were primarily due to gas gangrene, septicæmia, heart failure, or pneumonia. Under these circumstances it is not surprising that no conclusive evidence can be gained. The difficulty of arriving at truth in human therapeutics is notorious. It would certainly be very satisfactory, and ample reward for work expended, if the real value of antitetanic serum in the treatment of tetanus could be definitely laid down.

Millions of cubic centimetres of antitetanic serum have been used since the war began. If it could be proved to be of no use it would mean a great lessening of pain and inconvenience to the men suffering from tetanus, and economy to the State.

If it were possible and legitimate to stop all treatment of tetanus in the army by antitetanic serum for six months or a year some valuable information might doubtless be obtained. But this is not practicable since the consensus of opinion of medical officers in this country is decidedly in favour of this specific treatment. The only thing to do, then, is to redouble the efforts to make the therapeutic application of the serum as thorough as possible. This can best be done, according to the Tetanus Committee, by the recognition of early symptoms and the thorough application of the antitoxin without any loss of time by the intrathecal route.

It must be clearly understood that these remarks only refer to the therapeutic or curative use of antitoxin. The enormous value of antitetanic serum as a prophylactic is firmly established beyond any shadow of doubt. It is to be sincerely hoped that there will be no slackening in its use as a prophylactic, and that medical officers in charge of wounded in home hospitals will give the recommendations of the Tetanus Committee in regard to the repetition of these prophylactic doses a thorough trial.

OTHER THERAPEUTIC REMEDIES.

1. *Carbolic acid injections.*—During August, September, and October, 1916, there were only 2 cases treated with this drug, 1 recovered, 1 died. Case 410 is reported to have had ℥10 of a 2 per cent. solution, but how often or how long is not stated. Recovered. Case 444, 2 c.c. of a 4 per cent. solution every two hours for three days. Died.

2. *Magnesium sulphate.*—Only one case was treated. Case 486. Intrathecal injections of ℥40 of 25 per cent. solution daily under nitrous oxide anæsthesia. Died.

CONCLUSIONS.

1. In the 200 cases of tetanus under review the mortality was 36·5 per cent.

2. The greatest number of cases occurred between the ninth and the fourteenth days.

3. Only 3 cases are reported to have received secondary prophylactic injections of antitetanic serum in home hospitals.

4. In regard to the therapeutic effect of the serum the evidence as collected from the August, September, and October, 1916, reports is not conclusive.

5. The summary given in the last analysis in regard to treatment may be repeated.

(*a*) Place in a quiet, darkened room under the care of a sympathetic and capable nurse. "Rest, sleep, and food" are looked upon as the first essentials of treatment.

(*b*) If thorough surgical treatment is carried out on wounds from the beginning so as not to allow the presence of necrotic tissues or foreign bodies, the number of cases of tetanus should sensibly diminish, if not altogether disappear. But if a case does occur then the wound should not be actively interfered with until the tetanic symptoms have subsided.

(*c*) The intrathecal injection of large doses of antitoxin, of high potency if available, should be begun at once and supplemented by intramuscular and subcutaneous injections.

(*d*) In addition, if necessary, the patient should receive sedatives, of which morphia in ¼-grain doses and administered every four hours is perhaps the most suitable. Chloral, chloretone, and other sedatives may also be given by the mouth or rectum.

THE DETECTION OF *ENTAMŒBA HISTOLYTICA* AND ITS CYSTS:

NOTES ON THE TECHNIQUE FOR CONDUCTING EXAMINATIONS OF HUMAN FÆCES.

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(A Report to the Medical Research Committee from the Laboratory, Mont Dore Military Hospital, Bournemouth.)

IT cannot be denied that attention to detail is the secret of success in laboratory technique. Of no examination is this more true than of the examination of fæces for the detection of *Entamœba histolytica* and its cysts.

Many laboratory workers, bacteriologists and biologists, have of late had to conduct such examinations, though previously they may have had little or even no experience of searching for cysts in fæces. The remarks which follow are not made with the object of instructing such workers how to recognise the *Entamœba histolytica* and its cysts, or in the differential diagnosis between this amœba and other protozoa and yeasts. Such instructions should come, and are urgently required, from expert protozoologists. Rather do they aim at drawing the attention of inexperienced workers to certain details in technique which, in my opinion, will go far towards facilitating their work, and the neglect of which will not only render their work more difficult, but so difficult that even an expert working under similar conditions would be unable to express a confident opinion.

The Microscope: Illumination and Magnification.

1. *The lighting of the microscope.*—The examinations may be made by sunlight or by artificial light. It may be said, however, that one or other of these sources of light should be selected and adhered to; for it is advisable to make all examinations under as nearly similar conditions as possible. For this reason it is best to use artificial light under all circumstances. When available electricity should be preferred to incandescent gas, and the latter to oil. A film should never be examined until the lighting system is satisfactory. Even an expert cannot express an opinion on a cyst if the field of a microscope is faultily illuminated. The source of light should be so arranged that light only enters the eye through the microscope. With this object in view a piece of black paper may be spread under the microscope and the source of light may with advantage be enclosed in a light-tight cardboard or metal shade with a round hole two inches in diameter for the exit of the beam of light on to the mirror of the microscope. My fellow-worker, Mr. D. G. Lillie, places a Crookes's glass over the hole and finds that it softens the light and saves the eye from light fatigue, even after many hours of microscope work.

When electricity is available any powerful electric lamp will do so long as the glass is "frosted." A very serviceable light is the Royal Ediswan Downlite of 50 candle-power, fitted with small opal shades to throw the light well forward. Another lamp to which attention may be drawn is the American Lyhne reading-lamp. It is the most useful laboratory lamp I know of. Not only does it make a very good microscope lamp, but it is eminently suitable for illuminating the laboratory bench when daylight fades, and it forms an ideal light for "reading" agglutination tubes, &c. I obtained mine without difficulty through the General Electric Company, London.

2. *The microscope.*—Any of the good makes of microscopes such as are commonly in use in bacteriological and biological laboratories will serve. There are, however, in addition to good lenses two essentials. Firstly, an Abbe condenser is indispensable for obtaining satisfactory definition when the light is shut off by closing the diaphragm. The latter must be closed sufficiently to render every particle in the preparation clearly visible. Secondly, a mechanical stage is necessary, for the whole preparation must be examined systematically from beginning to end. With this precaution small infections are less likely to be missed, whilst they are sure to be overlooked if the preparation is examined at random.

3. *The magnification.*—Three magnifications—that is, three combinations of objective and ocular lenses—are advisable.

(*a*) The search for amœbæ or cysts should be made in the first instance with a low power. For the little experienced I consider the combination of a ⅔ inch objective with a ×12 compensated ocular, giving a magnification ×192, to be the best. In this way a large field is obtained—an advantage when working slowly—and the cysts are sufficiently magnified to make their recognition a certainty.

(*b*) When an amœba or a cyst is detected a ⅔ inch objective and ×6 ocular should be used. With this magnification (×390) a decision as to the nature of the amœba or cyst can be made in most cases. With a little practice the ×12 compensated eye-piece can be used advantageously with the ⅔ inch objective. A high magnification is thus obtained; the lighting can be adjusted by means of the diaphragm.

(*c*) In doubtful cases, when scrutiny of the nucleus can alone decide on the nature of a cyst, an oil-immersion 1/12 inch objective and a ×6 ocular (magnification ×750) should be employed.

A micrometer scale is essential for the accurate measurement of the size of cells or cysts.

The Preparation of Fæces.

The preparation consists of a suspension of fæcal matter in a conveniently sized drop of liquid on a slide covered with a cover-slip. The suspension should be made with care so as to avoid the retention of all coarse particles. This and the regulation of the thickness of the preparation are facilitated by the use of a dark background. The suspension should be of such thickness that, when covered with a cover-slip, no difficulty is experienced in focussing each individual particle with a magnification of × 390. When investigating a case of dysentery with active symptoms—that is, when blood and mucus are being passed—it is advisable to select carefully small pieces of mucus for examination. Further, such specimens should be examined first in any given batch of fæces, for the diagnosis is facilitated if the movements of the free amœbæ can be studied. As a rule such movements persist when the amœbæ are kept at room temperature, even during the winter months, for at least three to four hours. After this interval they gradually become less and less evident. In the investigation of carriers the cysts are distributed more or less evenly through the fæces, and the portion for examination may be selected at random.

The following fluids may be used for the preparation of the suspension of fæces.

(*a*) Examination in physiological salt solution. This is the accepted fluid medium for the examination for *Entamœba histolytica* and its cysts, and everyone should familiarise himself with the appearance of the various amœbæ and cysts in this solution.

(*b*) Examination in a coloured preparation. (Author's method.) This is an attempt to obtain a coloured preparation in which distinctive colouration is given to those elements demanding special scrutiny, whilst food débris, &c., are coloured with a contrast stain. At the same time, the amœbæ and their cysts retain their characteristic appearance as seen in salt solution. So far it has not been found possible to stain cysts satisfactorily in wet preparations, although, as will be seen later, iodine brings certain features of the cysts into prominence. The method here described depends on the fact that colour can be imparted to the highly refractile cysts by passing the illuminating rays of light through a coloured fluid. The food débris, &c., are actually stained with a contrast stain.

The beam of light from the microscope lamp is passed through a flask of 500 c.c. capacity filled with distilled water to which is added one drop (0·05 c.c.) of a 1 per cent. aqueous solution of methylene blue. The food débris, bacteria, &c., are stained by making the suspension of fæces in a drop of Czaplewski's fuchsin.

Fuchsin 1 gm. carefully dissolved in 5 c.c. of liquid carbolic acid. To this are added 50 c.c. glycerine and 100 c.c. distilled water. For use, take 1 part of the stain to 12 parts distilled water.

On examining such a preparation magnified 192 times the cysts are readily seen as circular highly refractile bluish-white bodies lying among the red-stain débris. Under the ⅔ inch objective the *Entamœba histolytica* cysts appear pale blue and, when present, the chromatoid bodies stand out as bright Cambridge-blue bands. The blue cysts are in marked contrast to the red particles of food débris, &c. A further advantage of the method consists in the fact that degenerate cysts become coloured by the stain, due, no doubt, to their being less resistant to the penetration of the stain. It is not claimed that the method facilitates the differential diagnosis between the pathogenic and non-pathogenic cysts, for such depends on many factors not connected with colour. The *Entamœba coli* cysts, however, assume a greyish tint and are very rarely so blue as those of *Entamœba histolytica*. Unquestionably the finding of cysts is rendered more easy in a coloured preparation, and it is for this fact and for the reason that it has been favourably received by my fellow-workers, who are eminently qualified to judge, that I venture to give publicity to the method.

(*c*) Examination in iodine-glycerine solution. (Author's modification.) The suspension is made in a drop of the following solution: Iodine 1 gm., pot. iod. 2 gm., aq. dest. 200 c.c. Add glycerine in the proportion of 1 drop to every 10 c.c. of the solution. Examination in iodine should only be used as a confirmatory test. The glycerine is added to overcome the difficulty that the iodine solution alone

agglutinates the fæces and renders the finding of cysts more difficult, and the number of cysts in any given sample of fæces appears to be actually reduced. By the addition of the glycerine this disadvantage is largely overcome. The advantage of this method as a confirmatory test is two-fold. Firstly, the nuclei of the cysts are rendered more plainly visible and the outline of the vacuoles is defined. Secondly, certain bodies which otherwise might be confused with pathogenic cysts are clearly differentiated by the stain. Yeasts, for instance, are untouched by the solution, whilst the so-called iodine bodies are stained in so characteristic a manner that they are easily recognised.

In my opinion the examination of stools for pathogenic cysts in all its phases is work for specially trained experts, and can hardly be mastered without a period of practical study under tuition. The experience of the past six months, however, has clearly demonstrated that cases of amœbic carriers are being missed because many of the laboratory workers, engaged in investigating such cases, are unable to recognise the cysts even in their most typical form. It is with the hope that it may prove useful to these workers that this article has been written.

If doubtful cysts are found in the salt solution or coloured preparation another sample of the fæces should be examined in iodine as a routine measure. Many mistakes will thus be avoided. Finally, all who undertake this very important work will do well to bear in mind this golden rule. Never express an opinion on a cyst unless you are satisfied that you have diagnosed it correctly. There will be other cysts about which you will be certain in other parts of the same preparation or in other parts of the same sample of fæces or in other samples of fæces from the same patient. It is worth while waiting for an accurate diagnosis. A hurried, faulty diagnosis can only mislead and may lead to disaster.

THE TREATMENT OF "TRENCH RHEUMATISM" AND ALLIED CONDITIONS BY COLLOIDAL SULPHUR.

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As a result of prolonged exposure to adverse weather conditions, and especially the extremely unfavourable state of cold and dampness which prevails during the winter months in the trenches, many men suffer from a painful and disabling condition of the muscles. This affects especially the parts which are chiefly exposed to damp—viz., the back and legs, and for want of a better name is popularly designated "trench rheumatism." As a rule the pathological process in these cases appears to be a myositis, which, if aggravated and prolonged, results in a fibrositis with permanent stiffness and deformity. Occasionally the condition is one of arthritis, especially of the knees and ankles; or both conditions are combined. A similar condition occurs among the men, usually of an elderly type, engaged on guard duties in exposed localities at home, but in these men the condition, having as a rule been recurrent for a considerable time, is apt to be more intractable.

Salicylates have had in my experience little effect in relieving the pain and stiffness, which are often considerable, and an attempt was made to introduce into the system sulphur in an easily assimilable form. The remedial action of many well-known anti-rheumatic waters depends upon the presence of this substance, its benefit in painful muscular conditions having long been widely known. Thus, Pliny recommends its application in ointment for lumbago,[1] and also extols the benefit of hot sulphur baths.[2] Paracelsus at the Renaissance appears to have rediscovered its merits, and eulogises it in high terms as "a preservative in all fevers." Since his time sulphur has maintained its high place in popular estimation as a cure for rheumatism, though the only method of introducing it into the body has been to administer the flowers of sulphur by the mouth. One of the most celebrated preparations for this purpose was the "Chelsea Pensioner," a name which indicates the prevalence of myalgia among the discharged soldiers of bygone wars.

[1] Nat. Hist., Book XXXV., Ch. 50.
[2] Ibid., Book XXXI., Ch. 32.

Colloidal Sulphur: Mode of Preparation and Dosage.

I was induced by the success which had attended the treatment of acute articular rheumatism by a form of colloidal sulphur in the hands of French observers[3] to try the intramuscular injection of colloidal sulphur in the severer cases of trench rheumatism which came into the wards under my charge. This preparation of colloidal sulphur has the double advantage that it is introduced into the affected muscles in a nascent state and in a form of extremely minute subdivision which offers a large surface for the action of the body fluids. The fineness of the particles may be judged from the fact that whereas the grains of the almost impalpable precipitated sulphur (milk of sulphur) have a diameter of 0·005 mm. or more, the granules of the colloidal sulphur vary from 0·0001 mm. or smaller up to 0·001 at most. The surface presented for absorption by the colloidal sulphur is therefore about 50 times that offered by an equal weight of the precipitated sulphur. The preparation used was made up for me by Mr. George Lunan, Queensferry-street, Edinburgh, who has kindly supplied the following note as to its production:—

"The process used in the manufacture of colloidal sulphur, 1 in 1000, is as follows: Hydrochloric acid (10 per cent. HCl), 22 mils.; sodium sulphide (Na_2S, 9 H_2O), 5 gm.: sodium sulphite (Na_2SO_3, 7 H_2O), 2·6 gm.; white of two eggs; sterilised water to 1 litre. Dissolve the sodium sulphide and sulphite each separately in 250 mils. of the water, mix together; add the white of egg and thoroughly mix. To this solution add the hydrochloric acid, diluted with 250 mils. of the water. The solution is then to be thoroughly mixed, warmed slightly, and sufficient sterile water added to make the volume 1 litre. The solution, after being carefully dialysed to remove crystalloids, is then ready for use. Theoretically, the product should contain 1 in 1000 of colloidal sulphur. The chemical action is explained as follows:—

$$2\,Na_2S + 4\,HCl = 2\,H_2S + 4\,NaCl, \text{ and}$$
$$Na_2SO_3 + 2\,H_2S + 2\,HCl = 2\,NaCl + 3\,S + 3\,H_2O.$$

Thus the sodium sulphite is reduced by the hydrogen sulphide produced from the sodium sulphide and hydrochloric acid. The presence of the albumin appears to prevent the aggregation of the sulphur into masses. In use the dose of 1 mil. is rendered isotonic by the addition of 2 decimils of 5·5 per cent. saline solution mixed immediately before injecting."

The dose with which I have been in the habit of commencing is 1 mil. (i.e., about 17 minims of the colloidal sulphur solution made up to 20 minims with the saline solution) injected into the painful area of muscle. If no reaction results, the dose may subsequently be doubled, the point of injection being slightly varied each time. In a course of 10 injections the affected muscle receives into its substance approximately 1/50 gm., or 1/3 gr., of nascent sulphur which is gradually absorbed.

Results of Treatment.

The following two tables show the effects of treatment in 60 cases. Severe cases only or cases of prolonged duration were chosen for these initial trials, but a large number of other severe and also slighter cases among soldiers and civilians have since been treated with equally satisfactory results.

The 60 cases here recorded include 24 expeditionary and 36 non-expeditionary men. In the majority of these the pain evidently originated in the muscles of the back or legs, there being 18 cases of myalgia among the expeditionary and 21 among the non-expeditionary cases. In 4 and 8 of the cases respectively the condition was of arthritic nature; and in the remaining 2 and 7 cases respectively the pain was quite definitely referable to the sciatic nerve, commonly the right nerve.

As regards duration, the pains were referred in almost every expeditionary case to repeated wettings in flooded trenches and had lasted several months, usually six to seven months, before admission to hospital. In the non-expeditionary cases the cause and duration were more varied, but some form of exposure was usually blamed. Some cases among the latter were chronic or recurrent for several years, and naturally these proved highly refractory to any form of treatment.

[3] Le Progrès Médical, August, 1915.

From the standpoint of result the 24 expeditionary cases showed in 14 complete cure, this result being attained after an average treatment of five weeks' duration; 7 of the cases were much improved; while 3 were ultimately discharged as medically unfit (d.m.u.) for further service, 2 of these for conditions other than the myalgia. Of the 36 non-expeditionary cases 17 were completely cured after an average treatment lasting three weeks; 12 cases were much improved; and 7 were discharged (5 of these for valvular disease of the heart). One-half of all the cases were thus completely cured, and

TABLE I.—*Expeditionary Cases.*

Case.	Disease.	Length of illness.	Treatment.	Result.
1	General myalgia.	6 months.	8 injns. 16-3-16 to 30-3-16.	Completely cured in July, 1916.
3	Subacute arthritis.	Several months. Treated without improvement at Bath. On crutches. Also malaria.	28 injns. 23-9-15 to 4-11-15; massage.	Walking well without crutches 26-10-15.
4	Arthritis of knee and myalgia with much bending of back.	5 months.	20 injns. 25-10-15 to 13-12-15; soda baths and massage.	Walking smartly and no pain 3-12-15.
6	Sciatica and previous lead poisoning.	Recurrent for 3 years.	6 injns. 22-10-15 to 4-11-15.	Quite well 11-11-15 (blue line on gums).
7	Myalgia of back.	10 months.	6 injns. 22-10-15 to 4-11-15.	Quite free from pains, though legs still weak 8-11-15.
11	,,	5 ,,	2 injns. 29-10-15 to 2-11-15.	Pains gone, though still debilitated 23-11-15.
12	,,	5 ,,	2 injns. 4-11-15 to 7-11-15.	Quite well and returned to duty 15-11-15.
14	,,	2 ,,	2 injns. 31-10-15 to 3-11-15.	Very much better 9-11-15.
15	Mild arthritis in knees and feet.	7 ,,	2 injns. 31-10-15 to 2 11-15.	Pains and swelling completely gone 9-11-15.
18	Myalgia in legs.	6 ,,	4 injns. 9-11-15 to 16-11-15.	Quite cured 23-11-15.
22	Myalgia in back.	4 ,,	4 injns. 29-11-15 to 5-12-15. 14 injns. 14-1-16 to 29-2-16.	Almost well and sent to convalescent home 15-12-15. Readmitted worse 14-1-16 and quite cured 11-3-16.
29	Myalgia in back and legs.	Over 3 months.	14 injns. 17-1-16 to 27-2-16.	Very greatly improved. Later d.m.u. for neurasthenia.
34	Myalgia.	Several weeks.	7 injns. 18-2-16 to 1-3-16. Sod. salicyl. brought down temp. but did not relieve pain.	Returned to duty cured 10-3-16.
36	Myalgia in legs.	Several months.	12 injns. 17-1-16 to 24-2-16; massage.	Returned to duty cured 11-3-16.
40	Subacute rheumatism.	8 months.	Sod. salicyl. 14 days without any effect; then 6 injns. 14-2-16 to 29-2-16; massage.	Pains relieved. Later d.m.u. for neurasthenia.
41	Myalgia.	4 ,,	5 injns. 4-3-16 to 12-3-16.	Returned to duty cured 16-3-16.
43	,,	2 ,,	5 injns. 12-3-16 to 20-3-16.	Cured 25-3-16.
47	Sciatica and subacute rheumatism.	Recurrent for 9 months. Admitted helpless on stretcher.	10 injns. 15-4-16 to 20-5-16; button cautery.	Pains gone; walking with very slight limp 1-6-16.
52	Myalgia in back.	Several months.	10 injns. 8-5-16 to 26 5-16. Soda baths; faradism.	Pains gone and only slight stiffness left 21-6-16.
56	Myalgia in legs.	2 ,,	10 injns. 16-7-16 to 3-8-16; massage.	Returned to duty cured 24-8-16.
59	Myalgia in back and legs.	Several ,,	10 injns. 15-8-16 to 4-9-16; massage.	Very greatly improved 4-9-16.
62	Myalgia, back, legs, and shoulders.	8 ,,	10 injns. 13-8-16 to 31-8-16.	Cured 30-9-16.
63	Myalgia of back.	9 ,,	9 injns. 15-8-16 to 31-8-16.	Very much improved 4-9-16.
65	,,	7 ,,	5 injns. 23-8-16 to 31-8-16. 10 injns. 20-11-16 to 8-12-16.	Previously treated at Buxton 7 weeks without improvement. Free from pain and much less stiff 28-12-16.

D.m.u. = Discharged medically unfit.
V.d.h. = Valvular disease of heart.

TABLE II.—*Non-Expeditionary Cases.*

Case.	Disease.	Duration before treatment.	Treatment.	Result.
2	Myalgia in back and legs.	Recent.	9 injns. 6-2-16 to 22 2-16.	Quite cured by 3-3-16.
5	Recurrent myalgia of back.	20 years. Present attack 3 weeks.	8 injns. 21-10-15 to 4-11-15.	Pain quite gone and returned to duty 10-11-15.
8	Subacute arthritis.	Over 1 year.	5 injns. 2-10-15 to 2-11-15.	Pain relieved, but ultimately d.m.u. for myocarditis.
9	Acute sciatica.	5 days.	2 injns. 28-10-15 to 30-10-15.	Greatly relieved, later quite well.
10	Subacute arthritis.	2 weeks.	3 injns. 29-10-15 to 2-11-15*	Almost quite well 28-12-15.
13	Sciatica r. and myalgia.	Recurrent for 10 months.	5 injns. 7-11-15 to 16-11-15.	Pain gone 23-11-15. Seen again and quite cured 8-4-16.
16	Myalgia in legs and back.	2 months.	3 injns. 11-11-15 to 16-11-15.	Pains almost gone 16-11-15.
17	Sciatica r., severe.	2 ,,	6 injns. 13-11-15 to 9-12-15; massage.	Almost cured. Seen again 5-2-16 and has been quite well.
20	Acute rheumatism.	1 week.	5 injns. 3-12-15 to 11-12-15. Also salicylate of soda.	Joints free by 12-1-16. Later d.m.u. for endocarditis.
21	Myalgia of back.	10 weeks,	2 injns. 3-12-15 to 5-12 15. Also soda baths.	Cured 27-12-15.
23	Subacute arthritis in hips and knee.	Recurrent, 6 months.	4 injns. 29-11-15 to 5-12-15.	Almost quite well.
24	Acute arthritis in wrists and foot.	1 week.	9 injns. 19-11-15 to 5-12-15.	Almost quite well, 5-1-16.
25	Myalgia.	6 months.	10 injns. 29-11-15 to 17-12-15.	Very much improved.
26	Myalgia of back and legs.	6 weeks.	7 injns. 17-1-16 to 29-1-16.	Transferred, somewhat improved, and later fit for duty.
27	Sciatica.	3 months (previously treated for gonorrhœal arthritis).	12 injns. 2-1-16 to 25-1-16; massage.	Very much better.
28	Myalgia, back and legs.	3 months.	9 injns. 14-1-16 to 29-1-16; massage.	Pains relieved. Later d.m.u. for myocarditis from 2 attacks of rheumatic fever.
30	Myalgia in back and legs.	3 weeks.	5 injns. 20-2-16 to 28-2-16.	Cured 2-3-16.
31	Myalgia in back.	Recent.	7 injns. 14-2-16 to 26-2-16.	,, ,,
32	Myalgia.	Several years.	5 injns. 1-12-16 to 9-12-16.	Pains relieved. Later d.m.u. for v.d.h.
33	Myalgia in back.	Treated for gonorrhœa 4 weeks previously.	3 injns. 25-2-16 to 29-2-16.	Cured 4-3-16.
35	Myalgia.	Some weeks.	9 injns. 27-1-16 to 25-2-16; massage.	Almost quite well.
37	Subacute rheumatism.	Some months.	11 injns. 14-2-16 to 10-3-16.	Pains relieved 10-3-16. Later d.m.u. for v.d.h.
38	Sciatica r.	Several weeks.	4 injns. 12-3-16 to 18-3-16. 10 injns. 7-6-16 to 27-6-16.	Very much improved 5-4-16. Recurred and again greatly improved. Finally d.m.u. for gastritis.
42	Pleurodynia.	Recurrent 7 months.	4 injns. 14-3-16 to 20-3-16.	Cured 22-3-16.
44	Sciatica.	7 weeks alcoholic gastritis	8 injns. 10-3-16 to 26 3-16.	Pain gone, still slightly stiff 26-3-16.
45	Myalgia in legs.	3 weeks.	3 injns. 22-3-16 to 26-3-16.	Cured 8-4-16.
46	Myalgia in thighs.	5 ,,	8 injns. 22-3-16 to 23-4-16.	Cured 29-4-16.
48	Myalgia in legs.	3 ,,	4 injns. 23-4-16 to 4-5-16.	Cured 5-5-16.
49	Sciatic r. severe.	Foll. 6 months after acute rheumatism.	10 injns. 4-5-16 to 22-5-16; button cautery.	Cured 24-5-16.
50	Myalgia in back.	Several weeks.	10 injns. 20-5 16 to 7-6-16; button cautery.	Greatly improved 21-6-16.
51	Myalgia in back and legs.	Since childhood.	10 injns. 30-5-16 to 17-6-16.	Not much improved. Later d.m.u.
53	Myalgia in thigh.	Several weeks.	10 injns. 13-6-16 to 1-7-16.	Returned to duty cured 1-8-16.
54	Acute rheumatism.	Third attack.	10 injns. 23-6-16 to 11-7-16.	Pains quite gone 4-8-16. Later d.m.u. for v.d.h.
55	Subacute arthritis.	Recurrent 27 months.	10 injns. 18-7-16 to 5-8-16.	Cured 4-8-16.
61	Myalgia in back and legs.	Recurrent 3 years.	10 injns. 13-8-16 to 31-8-16.	Quite cured 20-9-16.
67	Myalgia in legs.	Recurrent several years.	5 injns. 7-10-16 to 15-10-16; massage; faradism.	Very much improved 23-10-16.

* Injections stopped because of reaction with eruption.

one-third were very much benefited, but passed out of observation before it could be determined whether they would become quite free of their trouble.

The method of treatment finally adopted was to keep the patient in bed for the first fortnight, and to give the colloidal sulphur (beginning with 1 mil. dose and rising to 2 mils. if no reaction took place) every second day for three weeks. With this were combined massage on the alternate days, and occasional hot alkaline baths. Commonly there was no general or local reaction, but in some cases the temperature rose about 2° on the day after an injection; and now and then a painful swelling developed at the site of the injection, which was, however, readily dissipated by massage.

Conclusions.—1. Intramuscular injections of colloidal sulphur are of the very greatest value in the treatment of subacute painful conditions in the muscles and joints. 2. The most satisfactory course of treatment consists of an injection administered every second day for three weeks (10 injections), combined with rest and with massage on the intervening days. 3. In the greater number of subacute cases, lasting several months, complete recovery may be expected after three to five weeks from the commencement of the treatment. 4. This method is also very helpful in lingering cases of gonorrhœal rheumatism. 5. It does not, however, take the place of salicylate of soda in relieving the pains of acute articular rheumatism.

Edinburgh.

THE EFFECT OF VACCINIA ON THE WELL-BEING OF CHILDREN

AS JUDGED BY THEIR REACTION TO SUBSEQUENT INFECTIONS.

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THE immediate injuries and complications resulting from vaccination have been very fully discussed in the literature of the subject. It would appear that while the infectious disease vaccinia is mild, danger lies in the possible infection of the open wound, and that improved quality of vaccine virus and use of aseptic methods have greatly diminished this risk.

It has been alleged, however, that the constitutional disturbance produced by vaccination in the first year of life cannot be regarded as other than serious, since the effect of any mild infection at that tender age can gravely prejudice the child's future growth and diminish its resistance to disease. So far as I am aware, no information on this point has been published, and it has seemed that some evidence might be obtained by observing the effects of other infectious diseases in vaccinated as compared with unvaccinated children.

Accordingly a record has been kept of the presence or absence of vaccination scars on all children under 5 years admitted to the City of Glasgow Fever Hospital, Ruchill, during the years 1910 to 1913, and the accompanying tables show the incidence of death and of complications among the vaccinated and unvaccinated suffering from scarlet fever, diphtheria, measles, and whooping-cough. Tables for erysipelas, broncho-pneumonia, and enteric fever have also been prepared, but in these diseases the number of cases is so small that only total numbers are submitted. It may be stated that when doubt existed as to the presence or absence of vaccination scars friction was applied to the skin, and only those cases were regarded as vaccinated in which scar-tissue stood out pale against the hyperæmic skin.

In Table II. are given: (1) the number of children under 5 years of age admitted to hospital during the three years' period; (2) the death-rates among the vaccinated as compared with the unvaccinated in each of the diseases; and (3) a comparison is made to differentiate male and female children.

Age.—The number of cases is too small to allow of any useful information being derived from the figures relating to the different age periods. The mortality in the following age periods may be mentioned:—

Of scarlet fever cases in third year 9·4 p.c. of v. died, unv., 8·6 p.c.
,, diphtheria ,, fourth ,, 11·8 ,, ,, ,, 15·6 ,,
,, measles ,, second ,, 17·0 ,, ,, ,, 23·2 ,,
,, whooping-cough cases in first ,, 41·9 ,, ,, ,, 41·3 ,,

Convulsions provided a terminal symptom in the whooping-cough cases in which death was not accounted for by any of the tabulated complications.

TABLE I.—*Infectious Diseases in Children aged 0 to 5 Years in the Years 1910 to 1913.*

A. *Scarlet Fever—Males.*

Age periods.	Cases.	Deaths.	Vaccinated cases.									Unvaccinated cases.								
			Total number.	Pure cases.	Sequelæ and complications.						Deaths.	Total number.	Pure cases.	Sequelæ and complications.						Deaths.
					Joints.	Kidney.	Heart.	Lung.	Septic.	Other.	Sec. cases.	Other dis.									
0–1	19	3	12	6	—	1	—	—	2	—	1	2	3	7	6	—	—	—	1	—	—	—	—
1–2	74	15	58	25	1	—	—	1	26	—	2	3	13	16	3	—	—	—	8	—	—	5	2
2–3	116	6	97	46	—	2	1	1	39	—	—	8	6	19	12	—	—	—	5	—	—	—	—
3–4	151	6	139	70	3	4	1	0	40	3	4	14	6	12	4	—	—	—	5	—	1	2	—
4–5	166	7	158	99	—	2	1	1	29	4	7	15	7	8	3	—	—	—	3	—	—	2	—

Scarlet Fever—Females.

0–1	17	1	12	7	—	—	—	—	5	—	—	—	—	5	3	—	1	—	—	1	—	—	—	1
1–2	57	6	44	19	—	—	—	1	13	—	4	7	—	13	8	—	—	—	3	—	—	—	2	2
2–3	111	15	95	39	3	5	—	—	24	4	2	18	12	16	9	—	1	—	1	2	1	—	2	3
3–4	168	12	149	85	3	3	—	—	38	2	4	14	8	19	7	—	4	—	—	6	—	—	2	4
4–5	186	7	176	102	3	—	—	—	37	3	8	17	7	10	4	—	1	—	—	4	—	—	1	—

Sec. cases, Secondary cases. Other dis., Other diseases.

B. *Diphtheria—Males.*

									P	L							P	L		
0–1	45	9	24	19	—	—	—	2	2	1	4	1	5	21	8	—	—	—	2	2	1	8	—	4
1–2	99	19	80	54	—	—	—	5	1	1	13	6	15	15	9	—	—	—	2	—	2	4	2	4
2–3	134	30	117	81	—	—	—	5	4	4	13	10	27	18	12	—	—	—	—	2	1	—	3	3
3–4	131	17	119	84	—	—	—	—	6	12	17	15	12	5	—	—	—	—	1	3	2	1	2	
4–5	135	26	117	80	—	—	—	—	4	13	9	9	23	18	11	—	—	—	1	—	3	2	1	3

Diphtheria—Females.

0–1	28	13	15	11	—	—	—	1	—	—	2	1	7	13	6	—	—	—	2	—	1	3	1	6
1–2	96	16	72	40	—	—	—	5	4	2	11	10	12	24	18	—	—	—	1	1	—	2	2	4
2–3	116	27	97	75	—	—	—	—	2	1	12	7	19	19	15	—	—	—	1	—	—	—	3	8
3–4	130	15	110	73	—	—	—	3	2	16	4	12	12	20	12	—	—	—	1	2	1	2	2	3
4–5	138	20	125	98	—	—	—	—	1	13	1	12	19	13	10	—	—	—	—	—	1	1	1	1

P, paralyses. L, laryngeal cases.

C. *Measles—Males.*

0–1	50	15	25	14	—	—	—	6	2	—	—	3	8	25	16	—	—	—	4	2	2	—	1	7
1–2	111	20	78	49	—	—	—	21	5	—	—	3	12	33	20	—	—	—	10	2	1	—	—	8
2–3	118	14	97	69	—	—	—	18	7	—	—	3	12	21	12	—	—	—	4	4	—	—	1	2
3–4	96	9	80	55	—	—	—	12	8	—	—	5	6	16	13	—	—	—	2	1	—	—	—	3
4–5	83	1	72	53	—	—	—	2	10	—	—	7	—	11	10	—	—	—	1	—	—	—	—	1

Measles—Females.

0–1	32	6	17	9	—	—	—	7	1	—	—	—	4	15	13	—	—	—	2	—	—	—	—	2
1–2	92	18	69	45	—	—	—	15	5	1	—	3	13	24	15	—	—	—	4	3	—	—	1	5
2–3	107	8	83	63	—	—	—	6	5	—	—	9	6	24	17	—	—	—	4	—	1	—	2	2
3–4	102	3	87	71	—	—	—	4	3	—	—	9	2	15	11	—	—	—	3	1	—	—	—	1
4–5	74	1	63	51	—	—	—	6	5	—	—	1	1	11	7	—	—	—	2	2	—	—	—	—

D. *Whooping-cough—Males.*

0–1	53	26	9	7	—	—	—	2	—	—	—	—	3	44	30	—	—	—	8	1	3	—	2	23
1–2	72	22	47	24	—	—	—	17	1	—	—	5	16	25	16	—	—	—	6	2	—	—	1	6
2–3	75	10	57	33	—	—	—	17	3	—	—	4	6	18	10	—	—	—	6	1	—	—	1	4
3–4	83	5	71	50	—	—	—	13	—	—	—	8	4	12	8	—	—	—	3	—	—	—	1	1
4–5	48	4	40	33	—	—	—	3	—	1	—	3	4	8	8	—	—	—	—	—	—	—	—	—

Whooping-cough—Females.

0–1	58	20	22	13	—	—	—	5	1	—	—	3	10	36	26	—	—	—	8	1	—	—	1	10
1–2	77	21	51	31	—	—	—	14	1	2	—	3	16	26	20	—	—	—	5	—	1	—	—	5
2–3	65	6	48	35	—	—	—	6	2	2	—	3	2	17	6	—	—	—	6	1	2	—	2	4
3–4	100	7	86	67	—	—	—	13	—	1	—	5	5	14	8	—	—	—	4	—	2	—	—	2
4–5	63	1	59	44	—	—	—	6	5	—	—	4	1	4	4	—	—	—	—	—	—	—	—	—

TABLE II.

—	Total cases.			Mortality per cent.					
	—	V.	Un.	V.	Un.	V.		Un.	
						M.	F.	M.	F.
Scarlet fever	1065	940	125	6·6	9·6	7·5	5·7	3·2	15·9
Diphtheria	1053	876	177	17·6	21·5	18·6	16·5	18·2	24·7
Measles	865	671	194	9·5	16·0	10·8	8·2	19·8	11·4
Whooping-cough ...	694	490	204	13·7	27·0	14·7	12·8	31·8	21·6
Erysipelas	71	44	27	11·4	44·4	—	—	—	—
Broncho-pneumonia	33	20	13	30·0	38·5	—	—	—	—
Enteric fever	23	17	6	0	16·7	—	—	—	—

V, vaccinated. Un., unvaccinated.

Complications.—Again, if the prevalence of complications in the several diseases be considered, the following figures are obtained:—

Of scarlet fever cases	32·6	per cent.	of v.	developed	complications.	
,, ,,	37·6	,,	,,	of unv.	,,	,,
Of diphtheria ,,	11·2	,,	,,	of v.	,,	,,
,, ,,	17·5	,,	,,	of unv.	,,	,,
Of measles ,,	22·2	,,	,,	of v.	,,	,,
,, ,,	28·4	,,	,,	of unv.	,,	,,
Of whooping-cough	23·5	,,	,,	of v.	,,	,,
,, ,,	29·4	,,	,,	of unv.	,,	,,

And this constant predominance of complications among the unvaccinated is similarly distributed if the cases are subdivided into males and females.

Finally, if the most frequent complication in each disease is separately examined it is found that there developed—

Septic complications in scarlet fever in	26·9	p.c. of v.,	in	30·4	p.c. of unv.	
Diphtheritic paralysis in	6·5	,,	,,	7·3	,,	,,
Lung complications in measles in ...	14·5	,,	,,	18·6	,,	,,
,, ,, in whooping-cough ...	19·6	,,	,,	22·5	,,	,,

Discussion and Conclusion.

The figures deal with 3804 cases of infectious diseases, of which 3058 were vaccinated and 746 unvaccinated, and they show repeatedly an increase in the incidence of disease complications and death among the unvaccinated. A larger number of cases will have to be examined before this point can be regarded as generally proved.

It is not contended that vaccinia increases the resistance of the body to disease in general. The results obtained in this inquiry must depend in part on the inclusion among the unvaccinated of weakly children exempted from vaccination on purely medical grounds, and this inclusion may be sufficient to explain the increased vulnerability of the unvaccinated group. On the other hand, the healthy children of conscientious objectors to vaccination appear in the unvaccinated group, and the increase in the number of these children during recent years is shown in Table III., for which I am indebted to Dr. A. K. Chalmers, medical officer of health of Glasgow.

TABLE III.—*Glasgow: Statement of Number of Declarations of Conscientious Objection to Vaccination in Relation to the Births Registered.*

Year.	Births.	C.O.*	Per-centage.	Year.	Births.	C.O.*	Per-centage.
1907	23,926	474	2·0	1911	21,584	3791	17 6
1908	23,743	2183	9·2	1912	21,812	4371	20·0
1909	23,002	2653	11·5	1913	28,688	6804†	23·7
1910	22,014	3231	14·7	1914	29,455	7580	25·7

* Conscientious objectors. † Extended city.

Whatever be the explanation of the figures submitted, the fact remains that they afford no evidence that vaccinia has a prejudicial effect on a child's future well-being as judged by its response to subsequent infection. I have pleasure in acknowledging my indebtedness to Dr. John Brownlee, statistician to the Medical Research Committee, for suggesting this investigation and placing the information at my disposal.

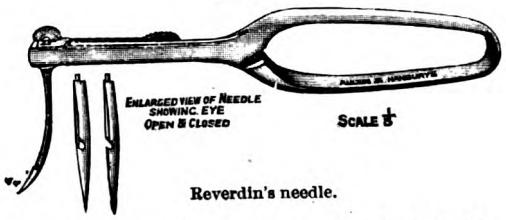
COUNTY OF ABERDEEN: REPORT OF TUBERCULOSIS MEDICAL OFFICER FOR 1916.—The report for 1916 of the tuberculosis medical officer for the county of Aberdeen states that during the year 393 cases were notified, the death-rate running almost parallel with that for the whole of Scotland. The doubts once entertained as to the advisability of the compulsory notification of tuberculosis have proved groundless. Notification has not led, as was feared, to sufferers from the disease being regarded as lepers. Occupation did not form an important factor in the incidence of the disease; heredity, defective housing, and malnutrition were found to be much more important factors. The report strongly condemns box-beds, and regards the housing problem as perhaps the most outstanding of the many difficulties associated with the eradication of tuberculosis. Among school children tuberculosis was found to be fairly prevalent, the usual site of the disease being at the root of the lungs, where the bronchial glands became affected. The report emphasises the need of after-care committees, and states that, on the whole, the expenditure under the county council scheme has been justified and has borne good fruit.

ON THE SOLE USE OF REVERDIN'S NEEDLE.

BY VICTOR BONNEY, M.S., M.D., B.SC. LOND., F.R.C.S.,
SURGEON TO THE CHELSEA HOSPITAL FOR WOMEN AND TO THE MILITARY BRANCH OF THE MIDDLESEX HOSPITAL AT CLACTON; ASSISTANT GYNÆCOLOGICAL SURGEON TO THE MIDDLESEX HOSPITAL, ETC.

THE subject of how to save time in surgical operations is always important, and I am therefore venturing to describe a method of general operative technique which I have employed to that end for nearly four years. It turns upon the sole use of Reverdin's needle. (Fig. 1.) The needle in question, which, it may be recalled, has an eye that can be opened and closed by means of a slide, is employed in this country, but to nothing like the same extent as in France, where it is the only needle in common use. Its great advantage is that it renders a second assistant to thread the needles unnecessary, for they are threaded by the first assistant, and he and his chief are therefore in this particular self-contained.

FIG. 1.



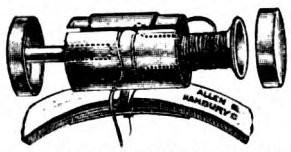
Reverdin's needle.

The Use of Reverdin's Needle.

For those who are not accustomed to this needle it may be remarked that its use requires a little practice. There is a tendency at first to open the eye whilst passing it through the tissues, especially if these are resistant, or to forget to close it before drawing it back, either of which mistakes causes the needle to catch in and lacerate the tissues, while the needle itself is very likely to be damaged.

Another and very important point concerns the assistant who threads it. Unlike a *notched* needle, in which a degree of tension must be kept upon the suture during the withdrawal of the needle, the assistant, once he has placed the suture in the eye and the slide is closed, *must let the suture go loose.* If he pulls upon it, the withdrawal of the needle is rendered jerky, and the slide that closes the eye is liable to be injured.

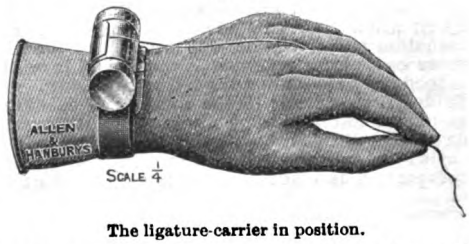
FIG. 2.



The author's wrist-ligature carrier.

The whole instrument is a delicate one; this is its drawback. The needles, which are detachable from the holder, require to be carefully looked after. They must be taken to pieces immediately after use, cleaned, boiled, and then stored in absolute alcohol, in which they will not rust.

FIG. 3.



The ligature-carrier in position.

The surgeon should have two sizes of needles, each in its separate holder, one being very fine for delicate suturing such as is required in intestinal anastomosis, and the other a coarser one for ordinary use.

Carriage of the Suture and Ligature Material.

In Paris I saw the suture material provided for in several ways. Thus, the surgeon carried in his left hand a sheaf of

ready-cut lengths; or the assistant cut off the lengths as he required them, from a reel placed near him. None of these methods seemed to me to be ideal, and I therefore devised the wrist ligature-carrier shown in Fig. 2. It consists of a little cylindrical metal box, opening at either end, in which is contained a glass reel on which the ligature material

FIG. 4.



Catgut on a reel.

is wound. The cylindrical box is attached to the wrist by means of a broad red rubber band in a similar manner to a wrist-watch. (Fig. 3.) This carrier is not only useful as a means of providing suture material with which to thread the Reverdin needle, but is a great time-saver when the surgeon has to ligature a number of vessels one after the other, as, for instance, in amputation of the breast. To use it most advantageously he should be able to tie the single-handed knot with equal facility with either hand. When operating I wear one of these carriers on either wrist, and my assistant does likewise. We are thus absolutely self-contained, having all the suture and ligature material we require in front of us.

FIG. 5.



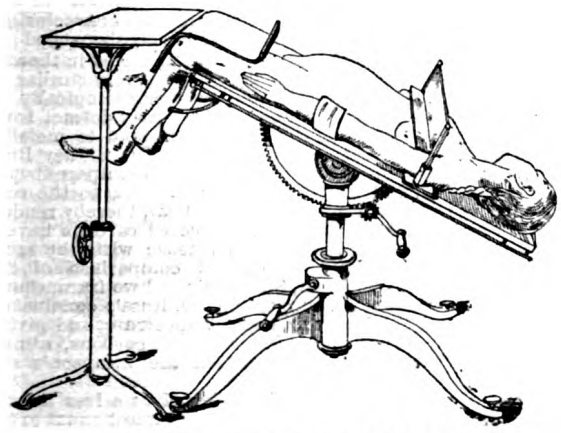
The author's "single-hand" scissors.

Any material the surgeon fancies may be wound upon the glass reel inside the carrier. Messrs. Allen and Hanburys put up at my suggestion a "tanned" catgut, wound on reels that fit the carrier. (Fig. 4.) Each reel, immersed in iodine solution, is contained within a glass tube, in which it is sterilised by superheating. The reel carries double the length of catgut that is contained in the similarly sterilised hank. For all purposes catgut is better wound on a reel, for hanks are troublesome to unravel, and in the process the catgut is often brought dangerously near to unsterilised areas.

Threading, Tying, and Cutting the Sutures.

The assistant threads the needle from one of the four carriers, according to the kind of suture material required.

FIG. 6.

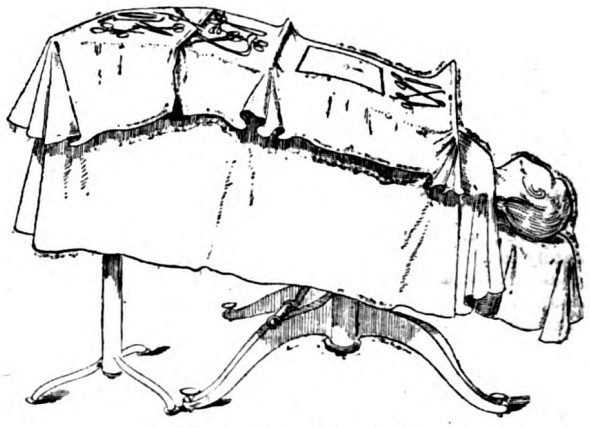


The knee table, screen, and elbow table in position.

The tying of the suture should be done either by the surgeon or the assistant, according to the side of the table from which the tying may be most satisfactorily and expeditiously accomplished. A large number of operative manipulations are best carried out from the assistant's side, and should be so effected. This, of course, postulates an able assistant. One great advantage of the technique I am now describing is that it makes for "team work."

Whilst the assistant is tying the suture the surgeon is passing the needle for the next one; and as he can do this quicker than the knot can be tied, he should cut the suture short himself, for otherwise an interval will elapse during which he is doing nothing. To avoid having to drop the Reverdin needle which he holds in his right hand or the dissecting forceps which he holds in his left, I have devised the scissors shown in Fig. 5. These scissors can be held in either hand in such a way as to leave the index finger and thumb completely free. The handles are gripped between the thenar and hypothenar eminences, and the shanks pass pass out *through the cleft between the index and second fingers.* They save much time otherwise consumed in picking up and laying down.

FIG. 7.

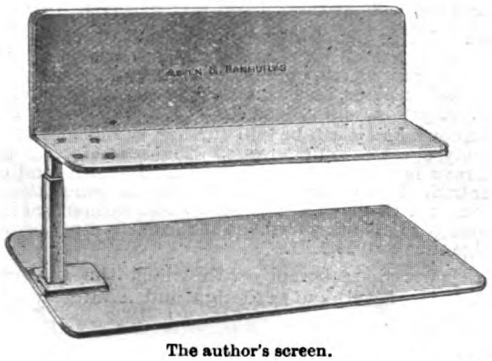


The complete arrangement.

Arrangement of the Tables and Disposition of the Instruments.

In order to complete the technique it is necessary to have the instruments and swabs so placed that neither the surgeon nor his assistant need turn away from the operating table to get them. To achieve this I employ the following arrangements in all cases of abdominal section for pelvic or lower abdominal disease. The patient is in the tilted position. On her knees is hung my "knee-table," shown in Fig. 6, which consists of a plate of thin metal bent across its middle to nearly a right angle and having a flange at one end. This device, when covered by the sterilised body-sheet, forms an excellent table on which instruments may be placed without slipping down between the thighs or into the abdomen. (Fig. 7.) Towards the head of the patient is placed the screen which I devised, shown in Fig. 8. It has projecting from it a ledge, which also forms a little table on which instruments can be placed. The screen and the knee-table having been placed in position, a sterilised body-sheet is laid over all, and an elbow-table on which are the instruments and swabs ready laid out is now brought up to the knee-table so as to extend its area. (Figs. 6 and 7.) A continuous sterile surface is thereby formed, the only break in

FIG. 8.



The author's screen.

which is the aperture left in the sheet for access to the site of the wound.

This aperture is the weak spot in an otherwise aseptic "operating bench," for the skin cannot be absolutely sterilised. To meet this difficulty, sterilised gauze, linen, or rubber sheets are attached to the edges of the wound in the usual way. The ideal would be to cover the skin with an absolutely impermeable sterile varnish which would remain perfectly adherent throughout the operation. I have tried to make such a varnish, but hitherto without success, although I have used a large number of substances; they all tend to peel off at the wound edges. The use of "crystal violet" as a means of providing a permanently sterile surface to the skin during an operation promises a solution of this difficult problem.

Conclusion.

The technique I have described requires a little practice, and an assistant trained in it; but these attained, it markedly facilitates and expedites operating. The mere fact of not having to turn round lightens and quickens the work; while the having of all one's appliances immediately to hand, and not being obliged to give orders or make requests to an assistant standing behind one's back, removes a potential source of irritability and impatience.

Devonshire-place, W.

ULTRA-VIOLET RADIATION:

A SPECTROSCOPIC INVESTIGATION OF SOME SOURCES OF ULTRA-VIOLET RADIATION IN RELATION TO TREATMENT BY ULTRA-VIOLET RAYS.[1]

BY CHARLES A. SCHUNCK, F.C.S.

As ultra-violet radiation is extensively used therapeutically I thought that a spectroscopic comparison of some of its sources, showing their constituent radiations, wave-lengths, and relative intensities, and the attempt to ascertain the most efficient for the purpose, would be of interest and value.

After describing the regions of the spectrum the following table was given:—

The Spectrum Regions.

Visible region ...	7594–3934 A.U.	† Lyman region ...	1230–600 A.U.
Ultra-violet region	3934–1850 ,,	Unexplored ,, ...	600–8 ,,
* Schumann ,,	1850–1230 ,,	X and Gamma ray...	8–0·07 ,,

* Schumann substituted fluorite for quartz and adopted a vacuum spectroscope to avoid absorption of the rays.

† Lyman in 1914, using a concave grating (dispensing with necessity of lenses) enclosed in a brass tube 11 cm. in diameter and over a metre long containing hydrogen at a pressure of 2 to 3 mm. and using a strong disruptive discharge through a discharge tube, was able to extend the spectrum to λ 900; and in 1915, by substituting He free from N for H and giving an exposure of about 10 minutes, repeatedly observed a number of new lines, the most refrangible of which was λ 600.

From λ 600 to about λ 8, where the softest characteristic X rays of Al have been recorded, is an unexplored region, the region where that profound change from light radiation to X ray takes place, and which, when means are devised for its investigation, may lead to most important results. Lyman considers it can be still further extended below λ 600 by purely spectroscopic means.[2] The wave-length of the soft X rays is of the order of 1 Angström unit and of the harder 0·25. The value 0·07 is for the most penetrating rays from radium C, given me by Sir Ernest Rutherford in 1915, who also gave his measurement of the hardest rays from the Coolidge tube as 0·14 A.U.

The Quartz Spectrograph, with which the spectra were recorded, is of well-known design and admirably adapted for the purpose.

The one completed for me last year by Messrs. Bellingham and Stanley, of 71, Hornsey Rise, has various improvements upon the original model of A. Hilger and Co., from whom I had one of the first in 1908. The salient features are its compactness, the complete enclosement of the prism, and lenses able to take the entire spectrum from the extreme red to the ultra-violet at λ 2100 on one plate 10 inches long in excellent focus throughout; when once set no further adjustment is required. [A description of the instrument was here given.]

For the arc spectra the voltage was 100, and the amperage was varied from 5 to 10. For each plate the amperage and exposures for each spectrum thereon were kept constant so as to get comparable results. The exposures in the arc spectra varied from 5 to 15 seconds, whereas the corresponding spark spectra took 2½ to 5 minutes. The plates used were Wratten and Wainwright pan-chromatic and the sources were compared on the same plate. The various sources were examined both in the arc and spark discharge, though the latter is hardly applicable therapeutically in general, the spark only being a point of light compared to the arc, and to be at all practicable would have to be condensed and then but a very small area would be covered. This might be useful in some cases, however.

The Sources of Radiation.

The sources of radiation examined consisted of—

Metallic electrodes of pure[3] W, Mo and Fe; ¼ inch carbon rods impregnated by boiling in solutions of sodium tungstate, uranium nitrate, ammonium molybdate, and titanous chloride; and ¼ inch cored carbons filled with U_3O_8, Fe_2O_3, wolfram (75 per cent. WO_3, 20 per cent. FeO, 5 per cent. MnO), the ore of tungsten, and pure W and Mo (99 per cent.) in the form of powder, together with the Simpson electrodes which are said to consist of wolfram. These are very unsteady in the arc, splutter badly, and a glassy deposit forms on the electrodes that has to be removed before the current will pass again, whereas the above carbons are quite steady, which is a great advantage.

The reason for trying the impregnated and cored carbons was the readiness one can assimilate any substance for the arc discharge and the endeavour to get, if possible, a more intense and cheaper source in this manner than the Simpson's or metallic tungsten. From the spark spectra experiments I had high hopes that the carbons impregnated with uranium nitrate and ammonium molybdate[4] would prove an excellent source, and rival that of W, whose spectrum is of a similar character. But though it has a more intense spectrum than W in the spark and of greater extent, it falls off considerably after λ 2500 and ends at λ 2300, compared to W in the arc, which extends to λ 2200 on this plate. W also appears to be more intense in the arc than the spark.

The Spectroscopic Results.

The following are the spectroscopic results obtained:—

The most intense and richest source of ultra-violet radiations is that of the W metallic electrodes in the arc. The spectrum[5] consists of very many lines of nearly equal intensity throughout the ultra-violet spectrum, so close together as to form an almost continuous spectrum extending with but slight loss of intensity to λ 2130 (the limit of the instrument). The W spectrum and the Simpson electrodes extend further with the same amperage and exposure than any of the sources examined.

The Mo arc spectrum is of a similar character but not so intense throughout, extending to λ 2190 but losing in intensity at λ 2300. The Fe arc spectrum is very rich in ultra-violet radiations, and though containing some very intense groups of lines is not so uniform throughout as that of W and extending only to λ 2250. Its spark spectrum is characterised by a maximum of intensity in the neighbourhood of λ 2400, which maximum λ2500 is not so pronounced in the arc.

The spectrum of the Simpson electrodes is very similar in character and of the same intensity spectroscopically as that of the W arc, but their unsteadiness may detract from their effectiveness therapeutically as compared to metallic W electrodes with treatment exposures. Dr. Sidney Russ was the first to examine the spectrum and to compare it with that of pure W, and he pointed out and came to the conclusion that they were apparently identical, thereby rendering a signal service. The wolfram cored carbons have a similar spectrum, but it is not so intense with the same ampèrage and exposure. A careful comparison of the spectra of metallic tungsten, Simpson's and wolfram, shows that though very similar, supporting Dr. Russ's conclusion, yet there are differences from the W spectrum, and giving an increased amperage to the wolfram carbons, almost an exact match is obtained between the Simpson's and them.

Of the cored carbons the W powder gives a less intense spectrum than the W electrodes. Fe_2O_3 almost equal to the

[1] Abstract of a paper read before the Röntgen Society.

[2] Theodore Lyman: The Extension of the Spectrum beyond the Schumann Region, Astrophysical Journal, March, 1916.

[3] W = Tungsten, Mo = Molybdenum, Fe = Iron, Ti = Titanium, U = Uranium, Mn = Manganese, C = Carbon.

[4] Known as the "Jones electrodes," and used as a source of light for recording absorption spectra in the ultra-violet, as the lines are so numerous and close together as to form almost a continuous spectrum.

[5] Shown at a meeting of the society last year by Messrs. Morphy and Mullard in their paper on "The Enclosed Tungsten Arc," and also by Major Wilson, C.A.M.C., when describing "a new tungsten arc lamp" he has devised.

Fe electrodes with advantage of steadiness which the latter lack, as they scintillate considerably. Mo powder like the Mo electrodes consisting of many lines extending to λ 2300, but not nearly so intense. The U_3O_8 was disappointing, and better results were to be expected. The oxide, however, was not reduced to the metallic state by the arc discharge which may be the cause, and shortly I hope to be able to examine the arc spectrum of metallic uranium electrodes. The spectrum loses intensity at λ 2600, but, so far, the lines are much closer together than W, and the spectrum more intense. The numberless lines and their closeness, both in the arc and spark spectrum of U, is its great characteristic.

The impregnated carbons in the spark are much more intense than in the arc. The uranium nitrate and ammonium molybdate impregnation gives a magnificent intense, almost continuous spectrum extending to λ 2300 without much loss of intensity, and is the most intense and richest in ultra-violet radiations of any spark source. The carbons impregnated with sodium tungstate were not nearly so continuous or intense. In the arc as far as λ 2500 the carbons impregnated with uranium nitrate and ammonium molybdate are more intense and continuous than the W arc, but their spectra do not extend as far, λ 2300 being about the limit. The sodium tungstate and titanous chloride impregnation are particularly poor. The same impregnated carbons were used both for the spark and arc.

Radiations of the sources used in treatment.—By comparing the arc spectra of carbon, the iron spark and arc, the mercury vapour arc, the Simpson electrodes and metallic tungsten in the arc, the nature of the radiations, and the intensity of the various sources that have been and are used in ultra-violet radiation treatment are seen.

Carbon is the source used in the Finsen lamp, the spectrum being very poor in ultra-violet rays and the exposure as long as 70 minutes at a time. After the Finsen lamp, I believe both the iron arc and spark were used, the latter with a quartz condenser with exposures of 3 minutes. Then the mercury vapour arc as in the Kronmeyer lamp, with a quartz condenser as a compressor on the skin, with exposures of 3 minutes or thereabouts. The spectrum consists of intense isolated bands and lines, the most intense and broad of all being just inside the Schumann region at λ 1849·6. A year ago the Simpson electrodes were the vogue until Major Turrell adopted metallic tungsten, with which the maximum exposure is 5 minutes without a condenser.

In regard to filament lamps, like the spectrum of all incandescent solids, the spectrum which is a continuous one falls short of λ 3000, so they are hardly suitable for ultra-violet radiation treatment where radiations of shorter wave-length are the effective ones therapeutically, as I believe I have been able to prove.

Therapeutical Experiments.

Through the valuable advice and assistance of Major W. J. Turrell, R.A.M.C., electro-therapeutic physician to the Radcliffe Infirmary, Oxford, to whom I am much indebted for the therapeutical aspect of ultra-violet radiation, I have been able to make some simple therapeutical experiments of the more intense sources.

Major Turrell [6] finds that the W arc (he was the first to apply this source) is the most efficient source clinically of ultra-violet radiation and superior in results obtained from the Simpson electrodes, which is supported by the spectroscopic examination. Within certain limits, he states, the intensity of the erythema produced on the skin in a given time may be taken as measuring the clinical efficiency of the radiation of the source. The open W arc he places 1 foot from the part to be treated, giving an exposure of 5 minutes with an ampèrage of 5 to 10, voltage 100, as the maximum dose.

The following experiments were undertaken :—

In conjunction with him my forearm was exposed for 5 minutes at a distance of 12 inches with a current strength of 5 ampères over different areas of the skin to the action of the electrodes in the arc, of metallic W, Simpson's and half inch cored-carbons filled with U_3O_8, W powder, wolfram and Fe_2O_3. The cored-carbons, which burned very steadily, gave no erythema. The W a fair reaction and the Simpson's slight in 12 hours; the former gave a slight redness in 2 hours, the latter very slight in the same time.

To get an increased effect I used the quartz cylindrical condenser under the same conditions as the spectra were taken, which forms an image of the arc 16 inches from the condenser in the form of a band about ½ inch wide on the skin of the forearm, the arc source being 3½ inches from the condenser. The current strength, voltage 100, was 9 to 10 ampères and the exposures about 2 minutes. An intense erythema was produced in a few hours with metallic W (indication in half an hour), not quite as much with the Simpson's (indication in 1 hour), and fairly intense with metallic Fe electrodes and the carbons cored with wolfram (indication in 2 hours). The exposure in this case was 2½ minutes, ampères 10. Using W as one electrode and a soft-cored carbon the other, alternately as "positive and negative," compared to W as both electrodes, there appeared but little difference in the erythema produced. With W as the positive electrode the arc is much the steadiest, and very steady indeed. The three spectra at 9 ampères and 10 seconds' exposures showed very little difference in intensity, W the best, then W as the positive electrode. Carbons impregnated with uranium nitrate and ammonium molybdate, 9 ampères and 4 minutes' exposures, gave a faintish erythema in 24 hours, but no reaction with an exposure of 2 minutes.

One mm. thickness of glass in front of the condenser with an exposure of 4 minutes at 9 ampères gave no reaction to the W arc, neither was there a reaction with a piece of microscopic cover-glass in front, whereas the W arc with 2 minutes' exposure gave a good redness on the skin in 12 hours. These cover-glass experiments were repeated several times, and there was no difference if the glass was placed on the skin. Only in one experiment was there a slight reaction with 2½ minutes' exposure and 10 ampères, and in this experiment I am not certain whether the glass was covering the lens completely. The 1 mm. glass and the cover-glass tested spectroscopically under the same conditions as the erythema experiments were made, cut off the spectrum at λ 2950 and λ 2750 approximately.

This shows, I think, fairly conclusively that radiations of λ 2750 approximately and upwards have no therapeutical value as judged by the erythema effect, whereas if the one experiment is correct there is an effect between λ 2750 and λ 2950. It must be remembered these experiments were only made upon my own skin ; still, an exposure of 4 minutes to the W arc with the condensing lens is a very severe test, seeing that in the arc experiment of 2½ minutes at 10 ampères the erythema was so intense that it persisted for three weeks, the skin desquamating and causing a fair amount of irritation.

Dr. Sidney Russ [7] last year stated that the skin is very absorbent to A.U. radiations.

A piece of skin from the human abdomen 1/10 mm. thick placed in front of the slit of the spectrograph with the Simpson arc 20 cm. distant and giving an exposure of 2 minutes, cuts off the spectrum approximately at λ 3000, showing that ultra-violet radiations between λ 3000 and λ 2100 are very easily absorbed by the human skin, and this is the *same* region I find of therapeutical value. "With thickness of ¼ mm. and 1½ mm. of skin and an increased exposure of 8 minutes the radiations between λ 3000 and λ 3800 were transmitted, but he considers it is doubtful whether more than 1 per cent. of the radiation penetrates as deep as 1 mm."

These two sets of experiments tend to show that the therapeutical effect is limited to the superficial tissues, and this is also the opinion of Major Turrell from the clinical aspect, who states in the paper above mentioned that "the therapeutical value of ultra-violet radiation appears to be due to its destructive action on micro-organisms and to the active hyperæmia which it induces in the superficial tissues."

I have also proved while constantly working with the W arc in this research, that a sheet of 1½ mm. glass placed between the arc and the face is a perfect protection from the effects of the radiations, especially to the eyes, which are particularly sensitive, which is supported by my own experience, my eyes being much affected before adopting this means of protection. During one day's experiments I calculated I was subjected for half an hour to the W arc 1 foot away, and with this simple protection there was no effect on the eyes or skin.

I think one can safely assert that the radiations of therapeutic value lie between λ 3000 and λ 1850, and I am now endeavouring by spectroscopic means to ascertain which part of this region has the greatest therapeutic efficiency. The W arc is no doubt the most intense source of radiation there is at present for the purpose. The open arc can be increased in intensity by using a quartz condensing lens, the absorption of which for these radiations is but slight. Pflüger for a piece 1 cm. thickness gives the values of

[6] Ultra-violet Radiation from the Tungsten Arc, Section of Electro-Therapeutics of Royal Society of Medicine, Oct. 20th, 1916 ; THE LANCET, 1916, ii., 790.

[7] From the Visible to the Gamma Ray Spectrum, Brit. Med. Jour., Jan. 22nd, 1916.

5·8 per cent. at λ 2200, 8 per cent. at λ 2140, 16·4 per cent. as λ 2030, but as much as 32·8 per cent. as λ 1860; while Collentz finds that throughout the spectrum to λ 2500 it is almost perfectly transparent in thicknesses up to 3 cm. If a reflecting mirror is used,[8] then platinum and nickel will be found superior to silver, and silicon the best of all reflecting surfaces. Silver reflects on an average 30 per cent. of the radiations between λ 3000 and λ 2000, platinum and nickel about 45 per cent., but silicon as much as 76 per cent. Mirrors of these substances can be readily prepared by cathode spluttering or electro-plating.

I have to thank Dr. Oberlander, Ph.D., Mr. J. C. Gardiner, F.C.S., and Mr. Arthur Schiff for the pure substances experimented with, and I am much indebted to Professor W. H. Perkin, F.R.S., for so kindly giving me the facilities of carrying on part of this investigation at the New Chemical Laboratories at Oxford.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF
ACUTE INTESTINAL OBSTRUCTION BY MECKEL'S DIVERTICULUM
SUCCESSFULLY TREATED BY LAPAROTOMY.

BY E. MANSEL SYMPSON, M.D. CANTAB., M.R.C.S.,
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As cases of Meckel's diverticulum are not common, and those of intestinal obstruction thereby still less so, the following notes may be of interest.

The patient, a thin lad of 21, was admitted to the Lincoln County Hospital on May 1st last with acute intestinal obstruction. Two years previously he had an attack of acute peritonitis. An operation was performed at a naval hospital, where the abdomen was opened in the middle line, and drained. Two days before admission to the County Hospital he was suddenly seized with acute pain over the whole abdomen, of a spasmodic type, followed by persistent vomiting, which in 12 hours' time became definitely stercoraceous. Constipation had been absolute from the start. On admission he had well-marked "facies hippocratica," furred tongue, with foul breath smelling strongly fæcal. Temperature 97° F.; pulse-rate 130, of poor volume and feeble. Over the abdomen respiratory movements almost universally absent, distension and tympanites were evenly distributed all over, well-marked "ladder" pattern, and peristalsis visible synchronous with exacerbations of pain. The abdomen was universally rigid and tense, with no specially tender spot or any localising sign. A provisional diagnosis of "strangulation by bands" was made. A middle-line incision about 5 inches long was made partly in the line of the old scar. At first sight of the contents of the abdomen the condition appeared hopeless, as the much-distended ileum and jejunum were bound up by very numerous adhesions, some well organised and of old standing, but the majority of only recent date. A thorough and systematic division of adhesions was made and the freed gut, after examination, was returned into the peritoneal cavity, but the bowel was still distended. It was noticed that although by far the greater part of the small intestine was obviously obstructed, yet the portion of it just above the ileo-cæcal junction was flaccid and of ordinary size and appearance. This part of the bowel was traced upwards for about 2 feet, where a Meckel's diverticulum was found, about 4 inches long, which was adherent at its tip to the posterior abdominal wall and to the root of the mesentery opposite the body of the second lumbar vertebra, thus forming an open small window, through which about 2 feet of ileum had become prolapsed and strangulated. The implicated bowel was in fairly good condition, so the diverticulum was removed on similar lines to an appendicectomy, and the abdomen was closed. The after-treatment consisted in administration of 1 c.c. of pituitrin 8-hourly, calomel (gr. 1) every hour for 10 hours, and frequent injections of brandy and saline fluid. On the second day the bowels were well opened, and the patient was back on a full diet on the fifth day. Convalescence was uninterrupted and he was discharged cured and entirely relieved on May 29th, four weeks after admission to hospital.

I am much obliged to Mr. W. F. Stiell, our resident medical officer, for these notes and for help at the operation.

[8] The Reflecting Power of Metals in the Ultra-violet Region of the Spectrum, by H. O. Hulbert, Astrophysical Journal, 1915, xlii., 205.

A CASE OF SUPRAPUBIC HERNIA.

BY WILLIAM H. FORSHAW, F.R.C.S. ENG.

CASES such as the one here described are of exceptional rarity. The only one I know of was described by Voeckler[1] in 1912.

A married woman, aged 41, with one child, aged 15 years, was recently admitted into the London Hospital. On the day before admission she, whilst in the act of micturition, suddenly felt a sharp pain just above the symphysis pubis. On examination of the region she discovered a lump which had never been noticed before. The pain of the swelling was intense and caused her to vomit every half hour, until she was admitted into hospital some 24 hours later. Her condition on admission was as follows: There was a hard, rounded swelling about the size of a doubled forefinger situated immediately above the symphysis pubis in front of the right rectus muscle, which was painful to the touch and gave no impulse on coughing. It was thought to be an interstitial inguinal hernia, but at the operation was found to be a strangulated hernia emerging from the abdominal cavity between the two recti muscles very near to their insertions. The sac was firmly nipped at the neck, and only with great difficulty could the director and knife be inserted. The constriction was divided in an upward direction—towards the umbilicus—to avoid danger of damage to the bladder. The gut was returned and the sac cut away. The stump was transfixed and sutured to the deep surface of the right rectus muscle. The patient made an uninterrupted recovery.

It is interesting to note that the patient also has a reducible left femoral hernia of three years' standing.

I am indebted to Mr. H. M. Rigby for allowing me to publish this case.

London Hospital.

A CASE OF ANTRAL ABSCESS TREATED WITH SALICYLIC ACID.

BY PERCY R. WILDE, M.D. ABERD.,
PHYSICIAN, LANSDOWN HOSPITAL, BATH.

ANTRAL abscess is often a very troublesome condition, and the following long-standing case in which the treatment adopted proved efficacious in stopping the discharge may prove suggestive.

The patient was an elderly lady with an abscess of the antrum which had existed for fourteen years. During this time the tube had been removed every night and morning and the cavity syringed with an antiseptic solution. Guided by the principle that all chronic discharging surfaces should be kept dry, and knowing that salicylic acid is one of the most powerful bactericides we possess, I treated her by plugging the antrum with a piece of gauze into which I had rubbed a powder consisting of salicylic acid one part and saccb. alb. four parts. This was passed loosely into the cavity and renewed daily. On the fourth day the discharge had ceased. Treatment was then suspended, a piece of cotton wool being placed over the opening of the sinus, which was kept in position by the denture the patient was wearing.

The treatment was effective. Three months later the patient reported that she had had no further trouble from the day of the last plugging.

Bath.

[1] Lejars: Urgent Surgery, second edition, p. 228.

A GENERAL monthly meeting of the members of the Royal Institution of Great Britain will be held on Monday, July 2nd, at 5 P.M., at Albemarle-street, Piccadilly, W.

BRISTOL INSURANCE COMMITTEE.—At the last meeting of the Bristol Insurance Committee it was stated that, compared with 1916, the number of men on the index register for 1917 showed a decrease of 5430, and women an increase of 3439.

Medical Societies.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF ANATOMY AND PHYSIOLOGY.

Perfusion of the Frog's Heart with Nicotine.—Modification of Fatty Compounds in Intestinal Epithelium.

A MEETING of this section was held on May 25th, Professor D. T. BARRY, the President, being in the chair.

The PRESIDENT read a paper on Perfusion of the Frog's Heart with Nicotine. He said that hitherto nicotine effects on the heart were chiefly investigated by dropping on the drug diluted without neutralisation. The results of perfusion after neutralisation were much more reliable; and this was the method employed in these experiments. Nicotine acted on nerve and on muscle, at first exciting and then depressing. The pure accelerator fibres were first stimulated, and in the fresh heart this acceleration was generally accompanied by increased tonus. Later the accelerators were depressed as shown by negative response to stimulation of the sympathetic, which prior to nicotine caused acceleration. The inhibitor mechanism was next excited, causing a slowing of the rate and cessation of beat with 0·2 per cent. solution, the heart remaining quiescent during one to three or four minutes. The purely augmentor fibres were excited early by nicotine, but this effect was best revealed after the stimulation of inhibitors had passed off. If the tone of the augmentors was increased by artificial stimulation before the drug, then the increase in force of the beat caused by this was very great. It had been shown by a simple device that the heart could perform more work in this phase, taking an augmented inflow comfortably and expelling it against increased resistance. Atropine did not counteract nicotine slowing. Atropine was said to paralyse the vagus endings in doses of 0·001 mg. or over. Amounts much greater than this were perfused for some minutes prior to nicotine perfusion, but without affecting the inhibiting action of the latter; therefore, it was probable that nicotine excited the post-ganglionic fibres of the vagus, just as it excited post-ganglionic accelerator fibres. A phenomenon of much interest observed frequently in the experiments was reversal of the heart beat by nicotine. The ordinarily subordinate mechanism of the ventricle was stimulated by the drug to predominance, so that the ventricle led the cycle. This might occur with or without cessation of the auricle beat as a preliminary, but the auricle-ventricle interval had been seen frequently to become shorter before reversal set in. It was also shown that a block could be temporarily broken down by nicotine, a 2–1 rhythm being converted to 1–1. Its action on the muscle connecting auricle to ventricle pointed rather to Englemann's view of a dromotropic delay in the impulse from above (lowered conductivity) than to the De Boer view of a prolonged refractory phase in the ventricle. Numerous graphic records illustrating the above points were shown.

Dr. F. W. LAMB gave an account of the various histological methods used in the study of fat globules in cells and discussed the modification of fatty compounds in their passage through the intestinal epithelium. He believed that all fatty bodies, with the exception of triolein, underwent an alteration or partial specialisation in the epithelium.

LONDON DERMATOLOGICAL SOCIETY.—The annual meeting of the above society was held at St. John's Hospital for Diseases of the Skin on June 19th, the President, Dr. W. Knowsley Sibley, being in the chair. The honorary secretary presented the annual report and said that the council were happy to record a successful year. The numbers had increased considerably; three new life fellows, 30 fellows, four members, and two associates had been elected during the present session. The officers elected for the ensuing year were Captain W. Griffith, R.A.M.C., President; Dr. Morgan Dockrell, honorary secretary; Dr. Knowsley Sibley, honorary treasurer. A clinical meeting followed.

Reviews and Notices of Books.

Obstetrics: Normal and Operative. By GEORGE PEARLA SHEARS, B.S., M.D., Professor of Obstetrics and Attending Obstetrician at the New York Polyclinic Medical School and Hospital. With 419 illustrations. London and Philadelphia: J. B. Lippincott Company. 1916. Pp. 745. Price 25*s.* net.

THE author has added this work to the already large number of text-books on the subject of Obstetrics, because he considers that most obstetric works contain too much irrelevant matter and too little about the practice of obstetrics. The book is based upon his experience in, and teaching at, the Cornell University Medical College and at the New York Polyclinic. With much of the author's teaching we are in complete agreement, but on some matters we hold different opinions in common with many British obstetricians, we feel sure. With the great importance of avoiding vaginal examinations and performing more frequent abdominal palpation we cordially agree. At the same time we think that in carrying out the latter manœuvre the advice to use the tips of the fingers and not the palms of the hands is quite wrong. The formation of the ring of Bandl, quite rightly according to English teaching, is attributed to excessive retraction of the uterus, but when the student is further told that the ring of Bandl is not present in tonic contraction of the uterus we entirely disagree. Dr. Shears appears to us to confuse the retraction ring and a contraction ring—two different conditions. The important clinical difference between secondary inertia of the uterus and tetanic contraction is not pointed out clearly. The teaching that the best method of treating an unreduced occipito-posterior presentation of the head may be to practise version, even when the head has passed the brim but is arrested in the pelvic cavity, or, failing this, the suggestion to rotate the head with the forceps rather than to carry out manual rotation, is contrary to the accepted practice in this country. The author, however, says that he has found rotation with the forceps easy and successful.

Dr. Shears maintains that clear and correct descriptions of the treatment of fœtal asphyxia are rare, and that some writers seem to have no positive opinions at all upon the subject. The description furnished in this book is not, however, by any means perfect; the fact that asphyxia pallida is really due mainly to shock, and that the chief danger is the heart failure which is present, is not stated—an important matter which in any description of this condition requires particular emphasis, since it forms the key to all successful methods of treating asphyxia pallida. In this section some very interesting details are given of the effect on the fœtus of oxygen inhalations by the mother, and the benefit to be derived from them is pointed out.

The book is in many ways a good one and should prove useful to the student. It is, however, somewhat spoilt by the slighting manner in which the author constantly refers to the writings of others. Many of his strictures are not deserved, and we can only conclude that he has not a very wide acquaintance with the best text-books of obstetrics in the English language, many of which are extremely practical as well as quite well written.

Commentaires de la Faculté de Médecine de l'Université de Paris (1395–1516). Publiés avec une Introduction et des Notes par le Dr. ERNEST WICKERSHEIMER, Bibliothécaire de l'Académie de Médecine. 4to. Paris: Imprimerie Nationale.

IN a large quarto volume of some 561 pages the librarian of the Académie de Médecine of Paris, Dr. Ernest Wickersheimer, has edited the "Commentaires de la Faculté de Médecine de l'Université de Paris" from the year 1395 to 1516. The Commentaires comprise 24 volumes in all and date from Nov. 6th, 1395, to November, 1786. Described in a few words, they constitute the administrative history of the Faculté de Médecine as recorded by successive deans. The origin of the faculty is not easy to trace, for though, according to the chronicler Guillaume le Breton, the art of healing and the care of the body were taught in Paris as early as the year 1210, *physici* or physicians are not

mentioned in documents until 1213, when, in an episcopal charge concerning the *licence* of the University of Paris, theologians, *décretistes*, artists, and *physici* are separately enumerated. In 1251 the University of Paris begins to employ the word *Medicina*.

In the fifteenth century, which is the period mainly covered by M. Wickersheimer's learned labours, medical education in the University is already being pursued with the help of certain books and by disputations. Every Bachelor is required to go through four courses, the first of which must be begun a fortnight after he has been received. A course is taken up with the study of a given book, such as the Aphorisms of Hippocrates, the Viaticum or Book VII. of Isaac Judæus, who died in the tenth century, Gilles de Corbeille on the Urine, the works of Rhases, Avicenna, Galen. It is curious to note that though the study and criticism of books were thus insisted on, there were only some 38 works on medicine and surgery in the library of the Faculty in the years between 1395 and 1516. These were manuscripts on parchment, some of them illuminated, and probably of value, for one was in pawn in 1395 *chez Guillaume Boucher*. Thirty-eight volumes could only necessarily go round among a very small circle of readers. Disputations were carried on by the Masters in Medicine and respectfully and quietly listened to by the Bachelors. One of the subjects was "Utrum rerum naturalium, non naturalium et preter naturalium, cognitio medico sit necessaria?" These disputations were called *Quolibets*, not because they were on any subject, but because the answer was Yes or No. Theses were written then as now, and a candidate for the licence might choose his examiner, who was probably his own teacher, but he had two assessors, and the transaction or bargain had to be above board—"sine fraude et deceptione."

The Medical Faculty comprised four grades—students, Bachelors, Licentiates, and Masters or Doctors. Students were not as young as most of the University men of that age, for they were required to pass four years in the study of medicine before obtaining the baccalaureatship unless they had previously graduated in arts, when the course was three years. In 1426 Pope Martin V. decreed that the medical licence could only be obtained by graduates in arts. A high standard of literary culture was thus ensured, though the science of the time had little value.

M. Wickersheimer's monumental work has been published under the auspices of the Ministry of Public Instruction and Fine Arts. It is one of the "Collection de Documents Inédits sur l'Histoire de France." The librarian of the Académie de Médecine is to be congratulated on his erudition. He is probably—to judge by his name—one of that long line of brilliant Alsatians who have adorned French science since the days of Adolphe Wurtz and Gerhardt. We understand that he is now at the front helping to win back those lost provinces that have contributed so greatly to the civilisation of France.

Reports of Inquiries and Appeals under the National Health Insurance (Medical Benefit) Regulations (England), 1915. Vol. I. London: H.M. Stationery Office. 1917. Pp. 163. Price 9*d*.

THE Insurance Commissioners have initiated a series of reports of the inquiries instituted by them under the medical benefit regulations, and these reports should prove very useful in connexion with the various questions which, in the first instance, are the subject of investigation by Insurance Committees and their subcommittees. The decisions which the Commissioners are called upon to give affect a wider and more varied range of subjects than might at first be supposed. The development and enunciation of the principles to be applied in cases where medical men, druggists, insured persons, and Insurance Committees find themselves at variance should tend to diminish the number of disputes arising as well as to the speedy and satisfactory disposal of them.

A considerable proportion of the cases referred to the Commissioners naturally bring under their notice comparatively simple questions with regard to which, when the facts have been established, there can be little doubt as to the course to be pursued. Among cases of this kind may be placed many of those in which a medical practitioner's removal from the panel is sought for upon the representation of an Insurance Committee. Such cases are quite rare when the large number of practitioners upon the panels, and the varying circumstances in which their lives have been spent, are taken into consideration. When a medical man is proved upon more than one occasion to have been in a state of intoxication when visiting his patients (Part I., Case VII., p. 13; Case XIII., p. 24), to have habitually left patients to be treated by an unqualified assistant (Part I., Case XVI., p. 34), or to have been the putative father of the children of a patient (Part I., Case X., p. 19), little remains to be said. His retention upon the panel would neither be desirable in the interests of his profession nor of his patients, and his case is as simple as those affecting druggists, in which fraudulent overcharges are proved to have been made, supported by proof of alterations deliberately made by the druggist in the doctor's prescriptions (Part II., Case V., p. 64; Case VI., p. 67; Case VII., p. 69). Other subjects are of greater complexity. Among these may be placed questions of proposed surcharge on the ground of alleged extravagant prescribing. Twelve appeals relating to this very important matter are included, and the fact that the decisions in this class of case involve questions of principle, and should serve as precedents, is emphasised by the use of headnotes summarising the conclusions arrived at. Thus we read (Part III., Case IV., p. 80) that—

> Statistical evidence does not suffice, standing alone, to justify the inference of extravagance, but in conjunction with evidence derived from the character of the prescriptions themselves, and in the absence of satisfactory explanation by the doctor, it may assist both in establishing the fact of extravagance and in enabling a reasonable estimate to be made of the additional cost thereby caused to the Drug Fund.

Naturally it is in cases where principles have to be sought for, and by which precedents of importance may be established, that differences of opinion may arise as to the correctness of the decision arrived at. In one such instance (Part IV., Case II., p. 123) a panel doctor was requested by a patient's mother to obtain a second opinion, a step which he considered unnecessary, and which in the end only served to confirm his diagnosis and treatment. On the ground that the consultation was unnecessary, and that in attending it he was acting on behalf of the patient's mother, the panel practitioner charged a fee. The Insurance Committee decided that the charge was a breach of the doctor's agreement, and the Commissioners rejected his appeal, holding "that as the appellant had, in fact, attended the consultation his action was for the general benefit of the patient, and in view of the mother's anxiety the consultation was not unnecessary." The question of fees for attending consultations in the circumstances indicated is likely to be raised more frequently when the provision of the opportunity for consultations arouses more frequent demand for them among insured persons, and no doubt the difficulty will then be more fully provided against. There is certainly an element of hardship in a case which compels a medical man to attend gratis a consultation considered by him unnecessary, with the alternative of absenting himself when another medical man seeks information as to the patient's condition and treatment.

The general impression conveyed by a perusal of the Commissioners' decisions, and of the principles upon which they are based, is one of an industrious endeavour to sift the cases before them with thoroughness and to arrive at just conclusions. This cannot always have been easy, for the questions raised have had many and varied aspects. The difficulties have arisen out of the administration of a complicated system of a novel character, necessitating the breaking of fresh ground and the creating rather than the following of precedents. Whatever view, however, may be held as to the merits of a particular decision or decisions, there can be no question as to the desirability of assembling and publishing such decisions in the convenient form adopted.

JOURNALS.

La Chirurgia degli Organi di Movimento.—All concerned in its production are to be congratulated on the first number of this new Italian surgical periodical. It is published by L. Capelli, Bologna, and the agents for this country are Messrs. Williams and Norgate. The first article, "La Mobilizzazione Chirurgica delle Anchilosi del Ginocchio," is from the pen of the editor, Dr. V. Putti, professor of orthopædics in the University of Bologna. Dr. Putti discusses very fully the operative treatment of bony ankylosis of the

knee by the latest methods, describes in detail those adopted by himself, and gives histories of cases in illustration. One of the cases cited is of extraordinary interest. The patient, a field labourer, was operated on for bony ankylosis of the knee in 1911. The method of operation adopted was that described by Dr. Putti in the *Archivio di Ortopedia* in 1913.[1] The ankylosis was broken down and the joint resected. The condyles of the femur were covered with pads of the fascia lata dissected from the patient's thigh, in the hope that a fresh synostosis would thereby be prevented, and that the aponeurotic tissue might take a useful part in the formation of a new joint. The result as regards mobility was not satisfactory, and three years after the first operation the patient requested further surgical intervention. Dr. Putti performed a second resection and found a condition of the joint which showed that the imperfect result of the first operation was due to its too conservative character and in particular to the non-removal of the crucial ligaments and the cartilage covering the articular surface of the tibia. The point of chief interest, however, is the condition of the covering of fascia lata which had been applied to the condyles of the femur three years before. This was found living and firmly adherent to the bone. It was removed in the course of the fresh resection and submitted to a histologist for examination. Under the microscope, while its original character, of an aponeurosis, was plain, it was seen to have undergone a considerable metamorphosis towards cartilage. The very full and interesting report of the histologist concludes as follows: "In conclusion, the fascia interposed in this patient between two osseous articular surfaces is living and is undergoing a cartilaginous metamorphosis which tends to reproduce the normal morphological conditions of the joint even in detail." Dr. Putti gives a very full and clear account of the technique he follows in his resections, and accompanies it with a series of admirable illustrations. Clinical histories are given of six cases of resection after his method. In the fully successful cases the mobility, strength, and general usefulness of the new joint are quite extraordinarily good.—The three remaining articles in the present number contain much that is of interest to orthopædists. Dr. Vaughetti writes on the present condition of prosthetic surgery ("Progressi Actuali della Plastica Cinematica"), while Dr. Delitala discusses the normal and pathological anatomy of the skeleton of the foot, with special reference to wounds, and Dr. Serra contributes a histological study of transplantation of bone in the human subject. A word of praise must finally be given to the typography of this number and to the excellence of the numerous illustrations.

The Military Surgeon. Washington, D.C. May, 1917.—The number opens with an appreciation of the Carrel-Dakin method of wound sterilisation, "the most valuable advance in the treatment of infected wounds" learned in this war, by Colonel William H. Arthur, Medical Corps, U.S. Army, Commandant of the Army Medical School. He notes the essentials to be, first, thorough opening and drainage, cleaning of the wound from foreign bodies and dead tissue, the complete arrest of hæmorrhage; then the continuous bathing of the wound, every nook and cranny of it, with an efficient, non-irritating bactericide. He concludes that the chemical skill of Dakin assisted the mechanical dexterity of Carrel.—Colonel Louis La Garde, Medical Corps, U.S. Army, retired, tells the civil profession they should join the Army now to help, and not delay till they can get the particular sort of work they prefer. He tells how Dr. Nicholas Senn, of Chicago, designated in 1898 as the chief operating surgeon of all the armies in the field, came to Cuba after the fighting was over and the wounded had been sent home, but, having no operations to do, was content to take 70 Cuban refugees and clean up a burned town to make a site for a hospital. That was the work his country needed done. That was the work Senn was ready to do.—Surgeon (Fleet-Surgeon that is) W. M. Garton, U.S. Navy, describes how the food of the men of the fleet is inspected in a United States dockyard. The Fleet-Surgeon (Principal Medical Officer of the Fleet) is responsible for the quality of the food, assisted by the Fleet pharmacist. He lays great stress on regular hours for supply to give time and light for inspection. Bread, milk, and apparently meat are inspected daily, clams, oysters, and yeast on Fridays, fowl and cake on Saturdays or the day before holidays, and ice-cream on Sundays. We hope the fowl, cake, and ice-cream, which appear to furnish forth the Sunday dinner of the U.S. Navy, may be found on this side not to fall below the Transatlantic standard.—First Lieutenant W. E. Fitch, Medical Reserve Corps, U.S. Army, discusses rations for boys in military training camps. He takes 4000 as the number of calories required by a man at active work, and, on the authority of Du Bois (Russell Sage Foundation), demands for boys 25 per cent. more, 5000 calories, to satisfy the ravenous appetites which result from the energy expended in exercise and growth. This food he supplies particularly in whole-wheat bread, eggs, meat, fresh vegetables and fruits, observing that long-cooked food, tinned meat, condensed milk, &c., have lost their vitamines, while he puts white patent roller process flour on the same level as polished rice. He gives his boys in camp meat at every meal, yet only about half a pound a day, but the calories he gets mainly out of cereals, potatoes, beans, and, of course, in America, pie.

Archives de Médecine et de Pharmacie Militaires. Tome LXVII., No. 1. January, 1917. Paris: L. Fournier.—In an article on Fractures of Bones, and especially Displacements of the Fragments, caused by Firearms, by Ed. Delorme, Médecin Inspecteur Général, Membre de l'Académie de Médecine, profusely illustrated by sketches taken from radiographic plates, the author states that the experiments concerning the result of gunshot wounds made on the cadaver by himself and Captain Jaricot in 1881 had enabled him to classify the principal types of fractures of the diaphyses and epiphyses of the bones. It appears that such a study gives often more precise results as to the lines of fissure than radiography owing to the super-position on the plate of both surfaces of the bone. These anatomical studies, supplemented by the examination of thousands of wounded men and of radiographic plates, show that: 1. The German S bullet acts similarly to its predecessors in causing the various lesions of the bones. 2. That shrapnel bullets give simpler types owing to their lower velocity. 3. That splinters from shells, grenades, &c., give types similar to those of shrapnel bullets with a few differences, such as (*a*) fractures without solution of continuity of the bone, which may or may not be comminuted; (*b*) fractures of simple types, with solution of continuity; (*c*) fractures of a complex type, more or less comminuted, with solution of continuity. He enunciates the two following laws: (1) A fracture of the diaphysis is less extensive longitudinally as the velocity of the bullet increases; but (2) as a rule, the fracture is more extensively comminuted as the velocity of the projectile is augmented. Inspector-General Delorme points out that trench warfare, with its shorter range, provides examples of the latter type of fracture more frequently than did fighting in the open during the earlier days of the war, and then deals in detail with all the fractures of the bones of the upper extremity, commencing with those of the fingers and finishing with the bones of the shoulder-joint. All these lesions conform to the following category: (1) abrasions or contusions with or without fracture by the contact of the bullet or splinter; (2) deep pitting of the bone; (3) grooving or guttering of the bone; (4) perforation, with the formation of large splinters, sometimes wedge-shaped, or the bone may be extensively comminuted and reduced to small fragments held together by the periosteum. The various types of callus are mentioned, and especially callus formed after gunshot wounds of the shoulder, where it is often extensive owing to the many centres from which ossification may proceed. Displacements of the bones are described, such as those of the forearm, arm, and shoulder, and M. Delorme insists upon the necessity of great care being taken to correct any vicious position. He has seen marvellous recoveries of joints when these have been implicated in serious lesions owing to the great care taken in rectifying faulty positions and the use of suitable appliances until healing has taken place. The author is not favourably inclined to primary excisions of joints unless the lesion is limited to the immediate neighbourhood of the joint and below the epiphyseal line, for if the diaphysis be implicated the surgeon may remove too much bone in his endeavour to go beyond all damaged portions of bones. Pseudo-arthrosis is found to occur most frequently after fracture of the radius alone, or ulna alone.

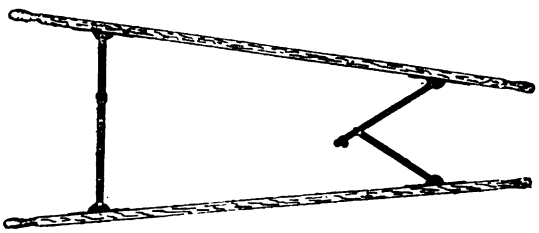
[1] L'interposizione di lembi aponeurotici liberi nella mobilizzazione chirurgica delle anchilosi e delle rigidita articolari.

Journal of the East Africa and Uganda Natural History Society. March, 1917. Longmans, Green, and Co. Price 5*s*. 4*d*.—The relation of climate to health gives particular interest to the several articles which have appeared from time to time in this journal on desiccation or the gradual drying up of rivers and lakes in Africa. In the current issue Mr. R. L. Harger gives a summary of observations on the subject made by older travellers—namely, Mr. G. W. Stow (*circa* 1843) and Livingstone—and records his own observations made between the years 1894 and 1906. A review of the facts stated show that the inland plateau of Africa up to the Equator can be divided roughly into three lateral zones: (1) From about the latitude of the Orange River to the Zambesi, where vast rivers and lakes have disappeared, leaving mere remnants, such as Lake Ngami; (2) from the Zambesi to the latitude of Lake Mweru, where large river systems and huge lake areas are in process of being drained; and (3) the equatorial belt, excluding Tanganyika, where the climate, rainfall, and vegetation are such, together with abundance of water, as to warrant the supposition that drainage and desiccation have not yet commenced.—A short note on Albinism in East Africa, by Mr. S. L. Hinde, expresses the opinion that possibly a larger percentage of albinos are born to negro parents in tropical Africa than is born to European parents in Europe. These children are seldom seen by Europeans, as many tribes destroy them at, or soon after, birth, and those that are allowed to survive are difficult to rear. Under the title of "A Rare Forest Francolin," Dr. V. G. L. van Someren, the honorary secretary of the society, describes the *Francolinus lathami schubotzi*, and a beautiful coloured plate shows the male and female of these birds.

New Inventions.

A BED-CARRIER.

AT this hospital last summer on fine days patients were carried out of doors in their beds. This necessitated carrying the bed and patient 100 yards and up and down a broad flight of ten steps. Four strong men were required to carry a single bed, and for four men it was a considerable exertion. From unequal lifting it was a strain on the bedstead. The bedsteads are light, of the ordinary hospital pattern, measuring 6 ft. 4 in. by 3 ft. 3 in.



The hospital carpenter made a bed-carrier by the use of which two men could do the work of four with less exertion. It is a simple contrivance. No claim is made for originality, but in view of its convenience its description is made known.

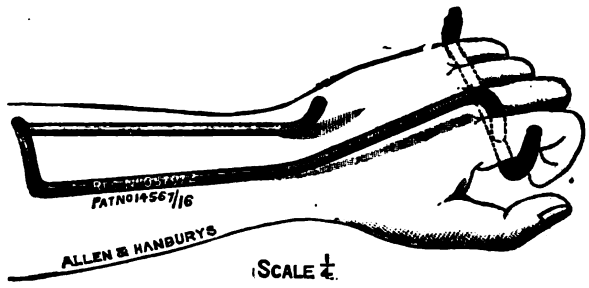
It consists of two stretcher poles, each measuring 104 × 1¼ × 2¼ inches, their ends fashioned to form handles (see figure). The poles are joined at a distance from either end, corresponding with the head and foot of the bed, by a jointed flat iron bar, one-half of which overlaps the other at the central join. The longer half is turned over at its end to grip its fellow, thus preventing over-extension. Each half has a hinged attachment to the pole to allow of the two poles being collapsed together. The carrier in use, when the jointed bars are extended, lies under the bed frame. Four buttresses on the poles rest hard up against each leg of the bedstead to prevent the bed slipping when carried up an incline. The two jointed bars when fully extended form a rigid iron bar which prevents collapse of the poles when a man at each end lifts the pole handles to carry.

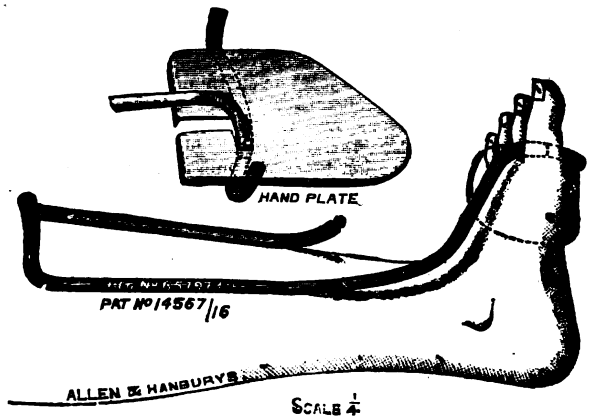
A. GEOFFREY EVANS,
R.N. Hospital, Mount Stuart. Temporary Surgeon, R.N.

WRIST- AND FOOT-DROP SPLINTS.

THE following is a description of two splints which have been found very useful in the prevention and treatment of "wrist-drop" and "foot-drop" in cases of injury to muscle and nerve. They have been designed by Miss Wharton, one of the dressers in the Hôpital Temporaire d'Arc-en-Barrois (Haute-Marne).

The splint is made of iron wire, strong enough to support the limb but capable of forcible bending to fit it to the peculiarities of individual cases. It consists, as will be seen in the illustrations, of a support on the palmar or plantar aspect of the limb, attached to a wire, which, passing between the index and middle fingers or great and second toe, crosses the dorsal surface of the hand or foot without





actually touching it, and continuing up the forearm or leg is fixed in the manner shown in the drawing, by a few turns of bandage. In the foot-splint the support is made in sheet metal, while in the hand it consists only of a single wire with a detachable sheet-metal finger support. In "*foot-drop*" the advantages of the splint as compared with the ordinary back splint, for example, are: Its simplicity, lightness (the patient is perfectly free to adopt any change of position he cares to without suffering the restraining influence of the heavy posterior splint), ease of appliance—e.g., a few turns of a bandage on the leg only, which renders it capable of appliance in spite of wounds, adaptability to cases, absence of any risk of pressure sore in the heel region and possibility of walking on crutches while wearing the splint. In "*wrist-drop*" its light weight is again the most commendable attribute, and the fact that the splint is fixed by a bandage on the forearm only, leaving the hand free and enabling the fingers to be used while the wrist is supported in a position of dorsiflexion to the amount desired for the case. If it is thought desirable to keep the fingers in an extended position the detachable finger support is used. If it were objected that there were pressure on the affected muscles, which is almost inconceivable in such a light apparatus, a modified form in which the arm-piece is applied to the anterior surface of the forearm is made. These splints are in constant use in the Arc-en-Barrois Hospital and have been found very effective in the prevention and treatment of foot- and wrist-drop and after nerve sutures. They have also been commended and adopted by certain French surgeons of other hospitals.

The splints are made and supplied by Messrs. Allen and Hanburys, Limited, 48, Wigmore-street, London, W., and catalogued by them as the "Wharton's Splint."

A. F. SINCLAIR,
Surgeon, Hôpital Temporaire, Arc-en-Barrois.

THE LANCET.

LONDON: SATURDAY, JUNE 30, 1917.

Mesopotamia: Then and Now.

THE Report of the Commission appointed to inquire into the Operations of War in Mesopotamia was presented to Parliament on Tuesday last, and constitutes one of the most tragic confessions of official muddle known to our history. The Report strikes us as moderate although so outspoken, for indeed the political and military miscalculations which led to the first advance on Bagdad, the siege of Kut, and the surrender of more than a division of first-class troops, with over 20,000 casualties, are now seen to have been gross. Coming to the breakdown in the medical arrangements; there is published with the Report a complete endorsement of the findings of the Vincent-Bingley Commission which went out to Mesopotamia early last year to review the medical arrangements; and from these findings, which form Appendix I., as well as from the whole Report it becomes clear that at the beginning of the campaign the provision for the sick and wounded was inadequate. After the battle of Ctesiphon and during the Kut relief operations the medical arrangements entirely broke down, and Surgeon-General HATHAWAY, the Principal Medical Officer in Mesopotamia, Surgeon-General BABTIE, the Director of Medical Services in India up to June, 1915, and his successor, Surgeon-General MACNEECE, are all found to blame in varying measure, despite the splendid work, acknowledged by the Commission, of the executive and regimental medical officers. No doubt each of the high officials desired to do his best, and no doubt each of them can show that he advanced claims for attention to the needs of his department which were not attended to by military or civil authorities, but it emerges from the Report that they did not recognise the seriousness of the situation. Lieutenant-Colonel R. M. CARTER, I.M.S., the first man to report truthfully to his superiors on what was really happening, was snubbed and even threatened. This makes a sorry tale.

An officer in the Royal Army Medical Corps who uses the pseudonym "MARTIN SWAYNE," has just published a book which deserves to be widely read as a sequel to the Report. The book is entitled "In Mesopotamia," and in it he tells us of a white doorway in a yellow wall which local tradition regards as the gate of the Garden of Eden. No garden is there now, but the gate is at the junction of the Euphrates and the Tigris. The two gigantic rivers rush through stretches of land so barren that no green thing was available for our troops on the march up from the Gulf. Tinned fruits and vegetables, which should have come, failed, and the men marched day after day drawing on the mineral salts stored in their bodies, and finally upon their own lecithin, until beri-beri set in and they were invalided back again to India whence they had come. Instead of a succession of fruits in the garden for the use of man, man became himself the soil on which flourished one after another a virulent series of bacterial crops. Plague followed cholera, and malaria found a seed-bed prepared by the enteric fevers and dysentery. The water of the rivers which once flowed through the garden, making possible the leafy shade in which the LORD GOD walked in the cool of the evening, was but the vehicle of deadly germs. Under such conditions it is no surprise that the sick and wounded were "lean, gaunt, haggard skeletons, hollow-eyed, with rivulets of perspiration furrowing the dirt of their faces." The vessels in which they came down stream from the fighting above consisted of ordinary river-boats with a big barge lashed on each side, on the deck of which the men lay closely packed under a single thickness of canvas awning. With the rising humidity of evening heat-stroke was often added to the other terrors. Such were the conditions for the sick and wounded in Mesopotamia in the first half of the war, which is now completing its third year, and such they would have remained if it had not been for the tardy but strenuous application of the principles of hygiene, principles sufficiently well known before but not applied.

Whether the insanitation was due to the parsimony or the ignorance of authorities, hard to convince of the certainty of disaster entailed by the lack of hygiene, is an idle speculation. The Garden of Eden is being restored. Irrigation on a small scale is already producing more than enough vegetables to supply the needs of troops and cattle. Up and down the whole length of the river water-purifying installations have been erected, each complete in itself and providing an abundant supply of pure water for so many units. Traffic on the river for the sick and wounded is no longer a protracted torture. A fleet of hospital ships, some of shallow enough draught to ply right up into the Armenian mountains, provide all the conditions for safe and rapid convalescence. One of these river boats, which we were able to describe last week from a personal inspection, is a model of applied medicine, each several requirement having received its appropriate attention. The enormous expenditure of thought and money in the directions which we have indicated has had already obvious justification, but to the clear-sighted medical administrator the prospect of their permanence adds vastly to the interest of his work. Not only for attack and defence are these conditions essential; they are also the conditions of peaceful development. The same irrigation, multiplied a thousand times, can turn Mesopotamia once more into a fertile plain, with an annual output of cotton and of corn worth hundreds of millions of pounds. Hospital ships, no longer required for maimed and broken men, can remain as the beginning of regular means of healthy river transit. The installations of pure water will be required as the nucleus of a vast permanent source. If the new Garden of Eden is better than the old, it may be because the medical profession has eaten to some purpose of the fruit of the tree, and turned to advantage its knowledge of good and evil, untrammeled by prejudice and vested interest.

The Day's Work and the Cost.

THE Cavendish lecture delivered before the West London Medico-Chirurgical Society by Captain ANDREW MACPHAIL, of the Canadian Army Medical Corps, Professor of the History of Medicine in McGill University, Montreal, will be found printed in full on other pages. Captain MACPHAIL has drawn a vivid picture with a sincere and accomplished pen of the work of the medical men at the front, choosing, as his example of "A Day's Work," the advance of the Canadian Corps at Vimy Ridge on Easter Monday, an advance which was carried out with brilliant success, the result of organised work by day and night through weeks and months of methodical preparation. On that day the Canadian Army Medical Corps played a part carefully rehearsed beforehand with the other actors in the great drama, and showed how ably men trained thoroughly and methodically in the hospitals of their home country in time of peace can adapt themselves, organise their methods, and apply their acquired knowledge and skill as integral parts of a vast army face to face with every death-dealing device employed by a resourceful enemy.

This is the principal lesson taught by Captain MACPHAIL in his address, but learned and eloquent man that he is, he has seized upon an unrivalled opportunity to suggest for our consideration many other matters of the first importance. We realise from his story that the work of a day to be effective, whether for a soldier or a surgeon, must be the result of training and preparation, and that even the initiative and resource which superficial observers may ascribe to natural ingenuity, stimulated by emergency in at least an equal degree, should owe origin to education and cultivated habits of forethought—habits which seem to have been considerably wanting in those responsible for the initiation of the Mesopotamia campaign. Captain MACPHAIL describes how on one occasion at the Western front an apparently ample supply of blankets for an expected flow of wounded into a dressing station was suddenly rendered insufficient by bitter wind and driving snow. Within an hour, however, 600 additional blankets were assembled and transported to where they were needed. Captain MACPHAIL adds that how this was done "does not matter," but we are free to conjecture that someone knew that something of the kind might occur, and had kept ready at the back of his mind details of how and where fresh blankets might be got, if the necessity for them should become urgent. Resource and readiness for emergency, as rendered possible by the medical man's early training, are not, however, only called for by such emergencies as a snowstorm. One of the side lessons taught in the lecture referred to is the fact that, whatever red tape may necessarily associate itself with all military organisation, no unalterable routine can regulate the arrangements to be made before a battle for the reception of the wounded, any more than the treatment of individual cases when they arrive can be laid down beforehand. Captain MACPHAIL says, speaking of the preparations made from early in February onwards for the battle of Easter Monday, "No one system will suit all engagements, and the system must be devised in case of defeat as well as in victory"; and he adds later, "I cannot insist too strongly that medical arrangements must be devised anew for each action; they vary with the plan of battle and must be modified as the battle proceeds." Throughout the war, in the exhibition of resource based upon training and knowledge, Captain MACPHAIL shows us, the Royal Army Medical Corps, with its ranks filled and refilled by men of varying degrees of scientific attainment, torn from the various branches of civil practice, has won high distinction. "It has yielded an army without sickness." The words are those of Captain MACPHAIL, who has never seen a case of typhoid at the front; and he speaks of London as "a place where men contract venereal disease," whereas our army, fighting and resting alternately in France under medical supervision, is free from it—the first army that ever could be so described in such circumstances. It is with little wonder, then, that we learn from the utterance of Captain MACPHAIL that "by the miracle it has performed of keeping the Army fit the consideration accorded to the service is unbounded."

But if the medical profession has gained distinction for itself by the manner in which it has accomplished its work in the war, most assuredly the cost of its success has been heavy. A recent Ministerial answer in the House of Commons told us that, excluding the figures which are not obtainable as to medical officers from oversea, the losses of the medical profession in Regular and Territorial officers have amounted to 137 killed in action, 58 dead from wounds, and 62 from disease, 707 having been wounded. How many may yet be added to the total of those who have lost their lives it would be rash to estimate even roughly, and none can reckon how many of those described as wounded have been permanently incapacitated from the pursuit of their professional careers. Those who have fallen have paid in full the price which war exacts from the patriot. They include among their number young men of high capacity whom a future generation might have seen taking their places as eminent figures in the world of surgery and medicine. They include many who would have served their fellow-men usefully and honourably, if without fame, and some others for whom the future might only have had in store worldly disappointment. All these, however, are now equal in the fact that they have died upholding on the battle-front the traditions of the profession of medicine which never before in its history has had so great an opportunity for showing its zeal in the cause of country and fellow citizen, and which has so manfully seized the chance. Let us see that in death they are not forgotten either by their colleagues or their country. When honourable mention is made of the achievements of medical and surgical science in the great war—and the records of that work will surely constitute a monument more enduring than brass—let the names of those be recalled who fell while tending the wounded and

the dying within range of the guns. The debt to them is one which in some measure can be repaid, for in not a few instances they will have left dependants whose mourning for their loss will be rendered more bitter by straitened circumstances. These will need our aid for many years to come, and a generation not yet grown to manhood and womanhood will have to extend a helping hand to some of them, and assist them to win independence for themselves. Meanwhile, as Captain MACPHAIL says, the end is not yet, nor is it even in sight, and the medical profession will continue to face the day's work from day to day, not reckoning too closely the cost in toil and money loss, but remembering those who have paid their share in the sacrifice of their lives.

Man Power and Medical Re-examination.

IN the House of Commons sitting as a Committee on the Army Estimates, Mr. PRINGLE, the Liberal Member for North-West Lanarkshire, moved last week a reduction in the vote for the War Office of £100 in order to call attention to what he termed "the scandal in connexion with the medical re-examination of discharged and rejected men." Mr. PRINGLE spoke at length and gave numerous examples which he considered formed a proof that, to quote his picturesque language, "the halt, the lame, the blind, the mute, the mad, and even the dead" had been summoned before the examining boards set up under the Military Service (Review of Exceptions) Act. Mr. PRINGLE was supported by Sir GODFREY BARING, the Member for Barnstaple especially bringing to the attention of the House examples of what he described as the insolent attitude of the military medical boards towards those submitting themselves for re-examination. The Under Secretary for War made a carefully considered reply, in which he admitted that under the Act whose working was being criticised some 950,000 men might be called upon for medical examination in the hope only of obtaining 120,000 recruits, half of whom, it was anticipated, would be placed in Class A. These official figures make it perfectly certain that the working of the Act was bound to be intensely unpopular, and that it would necessarily be attended with many cases of disappointment and hardship; but Mr. MACPHERSON was able to show that much of the criticism of his department was based upon an inability to comprehend the composition of the Army of to-day, and to appreciate the fact that it required one and a half men behind the lines to keep one man in the trenches, so that the majority of men who were called up would be required rather in work similar to civil employ than actually for fighting. If the India Office and the Government of India had had sufficient imagination to see this much in 1915, the disasters of the Mesopotamia campaign might have been avoided. Mr. MACPHERSON also made it clear that men who had served abroad and had been discharged from the Army for sickness or wounds, and who now come in under the working of the new Act, will be finally discharged.

Mr. ASQUITH adduced from the result of the appeals made to the County of London Tribunal during nine months that the work of medical boards displayed too large a margin of error, and thus gave authority to that aspect of the debate which reflected more upon the medical profession as recruiting officers than upon the administration of the War Office. In fact, the medical profession were placed by the debate in the unpleasant position, and not for the first time, of being, on the one hand, the objects of criticism, and, on the other, the bulwark behind which those criticised were sheltering themselves. We do not for a moment suggest that no errors in diagnosis have been made by military medical boards, but in spite of the evidence of the post-bags of Members of Parliament, we make bold to say that the margin of error has not been great, while it has grown steadily less. And has there been no reason entirely outside the discretion of the medical profession why certain of these errors have occurred? From all over the country, from all sorts of speakers, and in journals of every political and social complexion we have learnt that a large number of men, who would have been adjudged first-class fighting material, secured early exemption from service in the Army, leaving the medical boards to exercise their judgment upon a population which was thus lowered in its physical standard. Any percentage of error which has occurred must certainly have been increased by this factor. Again, certain of the cases which have given rise to the most distinct feelings of injury among those who have undergone re-examination have been due to the raising of their class as a recruit. But the system of classification had no medical origin. It was devised for military convenience, and recruiting medical officers have to exercise their judgment as best they can in conforming with its pattern. This is a point which the critics of the medical profession might once and for all be asked to remember.

The debate in the House of Commons on the Military Service (Review of Exceptions) Act was obviously political in its bearing. We are only concerned to place before our readers the medical aspects of the situation. The Act was considered necessary by the Government because there was an undoubted leakage which, in the interests of the country, ought to be stopped. It was bound to be an intensely unpopular measure, and every medical man knew that it would lead to many hard cases and much difficult and delicate exercise of judgment and diagnosis. In these circumstances the military medical boards appear to us to have discharged their painful and difficult duties with care and conscientiousness. We are perfectly aware that there must have been errors, but the errors, like the many cruelly hard cases, were produced by the provisions of the Act and not by the slackness or ignorance of the medical profession. Those who have criticised the medical profession most strictly are the least likely to possess accurate statistical information as to the percentage of mistakes which have been detected. A Parliamentary Committee has been appointed to examine the working of the Act.

Annotations.

"Ne quid nimis."

PERTUSSIS VACCINE.

THE employment of a vaccine in the treatment of whooping-cough is still on its trial and a large amount of work on the subject has recently been done at the whooping-cough clinic of the New York Department of Health. The vaccine has been freely supplied by the Department to practitioners in New York, and in a recent number of the *Journal of the American Medical Association* Dr. Paul Luttinger analyses the reports of 250 physicians who had used the vaccine. The clinical material was the average dispensary child on the East Side of the city. 952 cases treated with vaccine were compared with 149 similar cases treated with drugs; in the former the average duration of the paroxysmal stage was 37 days, in the latter over 50 days. The second week of the paroxysmal stage seemed to be the most favourable for vaccine treatment; earlier than this the vaccine sometimes did harm, while in the later weeks it was simply inert. Used as a prophylactic in patients exposed to infection, 94 per cent. escaped. Luttinger concludes that when the proper vaccine is given according to the method of the Health Department the disease is materially reduced in duration and severity, and that the results obtained warrant the routine administration of pertussis vaccine for both curative and prophylactic purposes. In the same number of the *Journal of the American Medical Association*, however, von Sholly, Blum, and Smith report a series of cases treated for whooping-cough by means of vaccines prepared from the influenza bacillus and from the whooping-cough bacillus and by a sham vaccine consisting of milk and water. They found that the results obtained by the non-specific influenza vaccine differed little from those which followed the use of the specific whooping-cough vaccine, and that the shortest cases were the non-vaccinated controls. None of the individuals inoculated with either vaccine for prophylactic purposes contracted the disease. These observers justly emphasise the great difficulty of estimating the value of any method of treatment in an illness as uncertain in its duration and irregular in its course as whooping-cough, especially when the patients are merely attending a clinic and living in their own homes, as was the case both with the series reported by Luttinger and their own. Their care in elaborating controls suggests that they feared the mothers of the patients might be, as it were, hypnotised by the new method of treatment into giving unduly favourable reports as to the severity and duration of the paroxysms. It is very much to be hoped that experiments with vaccine will be carried out on an even larger scale, and especially that its prophylactic effects will be very thoroughly tested. Infantile vaccination against whooping-cough, if effective, would save a very large number of lives even if the immunity conferred was of comparatively short duration. It is unfortunate that so little has been published on the subject in this country, and that the trials of vaccine which have certainly been made have not been reported. On the whole, results appear to have been negative, and it is possible that this may be explained by the extraordinary difference in the dosage of the vaccines supplied by firms in this country from that recommended by Luttinger. The vaccines here are sent out in doses of 5 and 10 million organisms, whereas 500 million to 10 billion were employed in New York. Admitting the great differences of opinion regarding vaccine dosage, there still seems remarkable discrepancy. The most striking observation made by Luttinger is that the presence of subconjunctival hæmorrhages in prophylactic cases which were protected by the vaccine seems to point to a specific immunising action against the paroxysms, and to the fallacy of the hitherto accepted theory that these hæmorrhages are due to the violence of the cough.

PARALYSIS OF THE RECURRENT LARYNGEAL NERVE BY BULLET WOUND.

A UNIQUE case of traumatic lesion limited to the left recurrent laryngeal nerve, without any injury to vessels, other nerves, or vital organs, has been published recently by Dr. U. Samaja, one of the military staff of the De Amicis Hospital at Bologna (*Gazzetta degli Ospedali e delle Cliniche*, No. 8). During an attack the patient received a shrapnel bullet wound in the left clavicular region; there was but little hæmorrhage and no hæmoptysis, although he was suffering from cough at the time. The wound of entrance was behind the clavicle in the supraclavicular fossa, 2 centimetres from the sterno-clavicular articulation. The bullet could be felt immediately below the second left rib about 1½ cm. from the sternal margin. The distance between the wound and the bullet was 10 cm. and its direction from behind forwards and from left to right. The skin between these two points was absolutely normal. A radiogram showed the existence of a fracture at the sternal end of the left clavicle and swelling of the sterno-clavicular joint. The apex of the left lung was more opaque than that of the right, pointing in all probability to a peri-pulmonary lesion. Persistent vocal alteration, which supervened immediately after the patient was wounded, was shown by laryngoscopy to be due to paralysis of the left recurrent laryngeal nerve, the left vocal cord being in a position intermediate between that of phonation and respiration, and remaining stationary during phonation. Thus the projectile, either directly or from hæmorrhage, of which the peri-pulmonary opacity was the residuum, had injured the left recurrent nerve and caused the vocal paralysis without damaging the lung itself, the subclavian vessels, or the phrenic and sympathetic nerves.

THE METROPOLITAN HOSPITAL SUNDAY FUND AND PAROCHIAL ORGANISATION.

THE claims of the Metropolitan Hospital Sunday Fund are brought forward with emphasis in the last issue of the *Hospital*. The editor lays stress upon the advantage which has already been derived in some instances from the organisation of hospital committees in individual parishes, which charge themselves with the duty of increasing the contributions of those who give to the Fund, and particularly of insuring that those who do not usually go to church on Sundays shall not forget it. It has frequently been urged in THE LANCET that those who do not attend Divine worship should contribute no less than those who do so, and that the latter should charge themselves with the duty of keeping the claims of Hospital Sunday before the former. No

doubt, however, this can be better done where the work is organised, and where families in which all are likely to be absentees are methodically canvassed and the claims of the hospitals laid before them. It is suggested in the article referred to that each parish adopting this plan should have a chairman, honorary secretary, and treasurer as permanent officers of its hospital committee responsible for the organisation of a body of workers in the cause. Perhaps it will not be too late in some places to initiate such a scheme in time to obtain a few contributions to the Fund before this year's subscriptions are sent in. At any rate the idea should not be allowed to drop, and we would add the suggestion that where there is any unreadiness on the part of those not members of the Church of England to be canvassed by neighbours representing the parish church, and associated with it, the members of other congregations should be able to organise collecting committees of their own, and thus to insure that no possible subscriber may be overlooked.

"SILENT PERITONITIS" AND SUDDEN DEATH.

AT a recent meeting of the Société Médicale des Hôpitaux de Paris M. Jean Minet called attention to acute peritonitis as a cause of sudden death which might go unrecognised. As a rule acute peritonitis—whatever its cause—produces such disturbance that it cannot pass unperceived, and the term latent peritonitis is applied only to the early stages of chronic peritonitis. It is difficult to believe that acute peritonitis can cause sudden death, in the strictest sense of the word, without betraying its existence in the slightest manner. But this occurred in the three following cases.

A soldier, aged 46 years, who performed clerical work, was found dead in his bed at 2 A.M. On the previous day, on the visit of the medical officer, he complained of pains on micturition. "Pyuria with albuminuria" was found and rest was ordered while awaiting a complete examination of the urine. According to his comrades he did not appear ill and he worked a little though exempt. He dined as usual and went to bed at the same time as the others. It was by accident that he was found dead. At the necropsy, performed on the following day, a large green patch extended over the distended abdominal wall. The peritoneum contained about a litre of reddish fluid and was covered with false membrane of recent formation, which bound together the coils of intestine. The true pelvis was walled off by a mass of old, thick, hard adhesions which enclosed the appendix. These adhesions limited an oval orifice 6 cm. in diameter, through which coils of small intestine passed into the pelvis. On being drawn out there was found 2½ metres of intestine of the colour of wine lees covered with hæmorrhages and showing a deep groove of strangulation at each end. The other abdominal organs were congested, especially the liver and kidneys. The right kidney contained a tuberculous mass of the size of a hazel nut. The bladder was full of purulent urine.

In the second case the patient was a soldier, aged 45 years, who worked in a munition factory. He came to hospital complaining of dyspnœa and cough. Râles were heard in the chest, especially at the bases of the lungs. He was put to bed. Cupping and cardiac tonics were prescribed and towards evening he slept. He was found dead in bed next morning. This sudden death of a man who manipulated dinitrophenol aroused suspicion of pulmonary œdema due to poisoning. At the necropsy œdema of the whole of the lower limbs and hands was observed. The skin was of a deep yellow colour. The lungs were congested at the bases but not œdematous. The abdomen contained about a litre and a half of purulent fluid and a recently formed false membrane uniting the intestinal coils to one another. A large mass surrounded the cæcum and adjacent intestinal coils and united them to the abdominal wall. In the centre was the appendix divided into two parts by a sort of strangulating groove. The proximal part was dilated and contained thick pus in which floated a stercoral concretion. There were "large white kidneys."

In the third case a man was knocked down by a kick in the abdomen. He fainted, but after a little time was able to go home. After resting he felt quite well, and went to the police-station to complain. On the following day he went to work and did not, according to his wife, complain of any pain. On the fourth day, after some vague malaise, he vomited greenish fluid, lay down, and died in a few minutes. The necropsy showed the peritoneal cavity full of fæcal matter and puriform fluid, and two perforations of the small intestine which had all the characters of a burst; the mucous membrane was everted, the orifice was irregular, and there was slight surrounding ecchymotic infiltration. There were no pathological changes in the intestinal coats. The abdominal wall showed no signs of injury. The assailant was prosecuted but acquitted, as M. Minet could not swear positively that the kick was the cause of the peritonitis.

In these three cases the peritonitis was completely "silent" during life, and the sudden death may be described as monosymptomatic of the condition. The point does not seem to have been noticed by medical jurists.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Total Laryngectomy.

IN a communication recently addressed to the Academy of Medicine M. Moure reports on 15 cases of complete laryngectomy performed during the last 27 months, recalling how serious an operation it has been considered for many years, the mortality having reached 95 per cent. In contrast to this high mortality all M Moure's patients, operated on for malignant tumours of the vocal organ, recovered from the operation, though not all derived permanent benefit inasmuch as in several cases the tumours recurred. A large proportion of the operations were done on very grave cases in which the new growth had already extended beyond the larynx and invaded the neighbouring tissues—œsophagus and pharynx. As regards the technique of the operation, M. Moure does not consider it necessary to "exteriorise" the trachea to ensure free breathing and prevent entrance of blood into the respiratory passages. In his opinion this course prolongs unduly an operation already long. His own procedure includes the following stages. Gauze is packed between a cannula placed in the trachea and the wall of the trachea. After removal of the larynx the wound is flattened out so as to diminish as far as possible the slough following the operation. Afterwards the wound is dressed two or even three times a day. In order to avoid the chief danger—viz., the risk of relapse—the operation should be done early while the malign tumour is still encapsuled in the thyroid sheath.

Heliotherapy in the Treatment of Gunshot Wounds.

M. Cazin, in demonstrating before the Academy of Sciences the results of the sun cure of war wounds obtained during the summers of 1915 and 1916, gave his opinion that the method of Rollier should be widely introduced in the hospitals, as it could be carried out everywhere with no special installation. In a certain number of cases of fractures complicated with suppurative arthritis, in which amputation appeared to M. Cazin inevitable, a fairly rapid and complete recovery was obtained by the sun treatment. An extension of its judicious employment should tend to shorten the treatment in a great number of gunshot wounds, and diminish the proportion of the infirm and unfit.

Radio-stereoscopy.

War surgery is likely to benefit materially by a new discovery, brought to the notice of the Academy of Sciences by Professor d'Arsonval—viz., the radio-stereoscopic apparatus of Dr. Lièvre, by which a direct stereoscopic view is obtained of images projected on the screen. The surgeon is thus enabled to see projectiles in their actual perspective, to ascertain their relation to each other, and appreciate the distance separating his instruments from the projectiles. The action of a simple reverser also permits him without moving the patient to obtain a stereoscopic view from in front or from behind. The apparatus is eagerly awaited by the field ambulances.

Resection of the Hip for Arthritis following Gunshot Wounds.

M. Potherat communicated to the Society of Surgery a note from M. Guénard, in which the latter affirms his belief in the safety of resection of the hip, even when in a septic

condition, since his results on a series of eight cases showed 100 per cent. of recoveries. All the cases operated on arrived in a condition of acute osteo-arthritis, one of them three days, another five days, up to 40 days after infliction of the wound, in several cases symptoms of gangrene being already present. His chief concern was always the gravity of the infection. The head and neck of the femur, including the great trochanter, are removed, retaining, whenever possible, the small trochanter. Posterior access appears the more convenient. A vertical segment of the capsule is removed from its posterior aspect, avoiding in this way too rapid a closing of the incision. The limb is immobilised in a plaster case, including both hip and knee. It is wise to control carefully the duration of immobilisation and remove the case as soon as possible, for such highly infected cases easily acquire pressure sores. The immediate result of resection is to abolish threatening infectious complications.

Severe Wounds of the Foot.

M. Quénu reported to the Society of Surgery 30 observations on wounds of the foot treated in field ambulances by M. Chalier. In one of these cases the soft tissues alone were concerned; the 29 others were osteo-articular wounds. M. Quénu divides these wounds into total and segmentary; the latter again into transverse (the commonest), longitudinal and wounds of the arch (fairly infrequent). Transverse partial wounds are again subdivided into wounds of the forepart of the foot, in front of, or on the interline of, the mediotarsal; wounds of the posterior part of the foot; and wounds of the ankle. The total of 30 foot or ankle wounds showed 3 deaths, 1 from tetanus and 2 from gas gangrene; there were 10 total mutilations (amputation of the leg), 4 partial mutilations (partial amputation of the foot), while 13 recovered without mutilation. Wounds of the forepart of the foot were the most favourable, although they accounted for 1 death by gangrene. Wounds of the posterior part of the foot accounted for 1 amputation for septicæmia. The cases of ankle wounds resulted in 1 death and 5 amputations, those complicated by lesion of the calcaneum being especially grave. For wounds of the arch there was one amputation, and the "total" injuries were responsible for 1 death and 2 amputations of the leg. M. Delbet, from experience at a base hospital, declared himself in entire agreement with M. Quénu, especially on the distinction to be made between wounds of the anterior and of the posterior tarsus. Posterior fractures with shattering of the calcaneum were specially grave. In these cases attention must not be concentrated exclusively on preservation of the foot; it was sometimes better to amputate than to run grave risks for the patient in order to preserve a foot which might in any case be of little use to him. M. Sébileau stated that by avoiding immediate systematic operation and allowing the wound free discharge in large warm baths of saline or carbolated water, he had achieved the remarkable result of saving the foot and its functions in every case. In cases where total ablation of the foot was indicated and the wound rendered this course practicable, M. Potherat recommended Syme's disarticulation. It was an easy and rapid operation for the surgeon, could be performed even in a septic area, was easy to fit later with any kind of apparatus, and resulted in but slight shortening of the lower limb. This operation is therefore far superior to amputation of the leg. M. J.-L. Faure regarded wounds of the posterior tarsus as always grave and most serious when the astragalus was involved and its articulations laid open. Astragalectomy was, in his experience, not infrequently followed by amputation of the leg after months of suffering and fruitless attempts to preserve the foot.

Foreign Body in the Intestine.

M. Tesson showed to the Society of Surgery a kind of chaplet of 136 porcelain buttons (similar to those worn on hospital blouses). The man from whom it was taken was not mentally deranged but suffered from gastric trouble, and used the chaplet as a gastro-œsophageal mop, claiming to obtain relief from it. One day the thread broke and the chaplet disappeared into his stomach. M. Tesson saw the patient ten days later at the height of an attack of general peritonitis due to perforation. The foreign body, lodged in the small intestine near the cæcum, was extracted by enterotomy. Death occurred next day.

June 25th.

ZINC WATERS—THEIR POTABILITY AND GERMICIDAL EFFECT.

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AND
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IN September, 1915, analysis of the drinking water of a small depôt in the Aldershot Command revealed the presence of 3·44 parts of metallic zinc per 100,000. The question naturally arose whether or not this water should be passed for human consumption. In November, Dr. J. C. Thresh contributed an article to THE LANCET[1] in which he recorded an instance where 2·3 parts of zinc per 100,000 had apparently caused no disturbance of health in a mixed community during a period of 10 years. An editorial note in the same issue referred to another case where some 4·6 parts of zinc were discovered in a public supply in Wales.

Source and Zinc Content of the Water.

In view of these experiences it was decided to pass the depôt supply for the time being, to notify the medical officer of the existing state of affairs, and to keep the water itself under fairly close supervision. This water has been the sole drinking supply for some 200 men for two years. During that time the health of the troops has been excellent, with the exception of one small outbreak of colic and diarrhœa involving only nine men in all. It proved impossible to connect this outbreak in any way with the water-supply. Furthermore, the commandant's house, prior to the introduction of the present system, obtained its water from a very contaminated well in the neighbourhood, and the children of the household frequently suffered, among other things, from various forms of "sore-throat." Since the new supply has been laid on all such minor ailments have disappeared, and the household drinks with impunity a water which has a definite metallic taste, and which has on one occasion been proved to contain no less than 4·72 parts of metallic zinc per 100,000. The source of supply is a shallow well situated on a knoll in the midst of cultivated clay soil about 1000 yards from the depôt. The well is some 30 feet in depth and contains from 4 to 6 feet of water. A windmill pumps the water through 1000 yards of galvanised-iron piping to a reinforced concrete tower capable of holding two days' supply. Thence it passes by more galvanised-iron service pipes to various points within the depôt. In the case of the commandant's house—a distance of some 400 yards from the tower—water is stored prior to use in a large galvanised-iron cistern.

The following table shows the varying amounts of zinc as estimated gravimetrically from time to time:—

TABLE I.

Date.	Galvanised iron.	Metallic zinc, parts per 100,000.	Date.	Galvanised iron.	Metallic zinc, prts. per 100,000.
25/9/15	Old storage tank.	3·44	10/9/16	1000 yards piping.	3·02
28/9/15	1000 yards piping.	3·58	10/9/16	1200 ,, ,,	3·77
17/1/16	1000 ,, ,,	2·985	6/12/16	1000 ,, ,,	2·09
17/1/16	1200 ,, ,,	4·076	6/12/16	1200 ,, ,,	2·44
3/3/16	1000 ,, ,,	2·38	6/12/16	1400 ,, ,,	3·32*
3/3/16	1200 ,, ,,	3·18	8/1/17	1400 ,, ,,	4·72*
18/4/16	1000 ,, ,,	2·51	17/1/17	1400 ,, ,,	4·27*
18/4/16	1200 ,, ,,	3·2			

* Galvanised-iron storage tank as well. The last two samples were drawn in the early morning.

It will be noted that there is tendency for the amount of zinc to decrease. The incoming water in the tower yielded on last examination only 2·09 parts of zinc as compared with 3·58 parts some 15 months previously. The amount of zinc dissolved must, of course, vary with the duration of contact. The well water, which is quite free from zinc, is neutral in reaction, contains between 2 and 3 parts of free CO_2 per 100,000 and shows only two parts of temporary hardness out of a total figure of 9. Its zinc solvent power, as tested experimentally on ordinary zinc foil, is considerable. The

[1] THE LANCET, Nov. 13th, 1915, p. 1098.

zinc is evidently held in solution as a bicarbonate, as it is completely thrown down by continued boiling. Liming the well water prevents more than a trace of the metal being taken up. Such being the case, one would expect an increase only in temporary hardness the greater the distance the water flows through the various pipes. It is found, however, that the permanent hardness increases to a considerable extent as well, a fact not so easy of explanation. The figure for non-volatile solids rises as more zinc is dissolved.

Bacteriological Investigation.

Various bacteriological examinations of the water have been made. The following are average results obtained from (*a*) four samples of the well water and (*b*) a similar number of tap water containing about 4 parts of metallic zinc per 100,000.

TABLE II.

—	No. of colonies on agar in 48 hours at 37° C.	No. of colonies on gelatin in 72 hours at 22° C.	MacConkey's bile-salt lactose broth.
Well water ...	32	109	Lactose fermenters in from 0·1 to 1 c.c.
Tap water ...	3	88	Lactose fermenters absent in 40 c.c.

The presence of zinc in solution appeared to inhibit the growth of organisms flourishing at blood heat, especially those fermenting lactose, while it affected but little others growing on gelatin. It was also noted that the decrease in the number of organisms seemed proportionate to the increase in the amount of zinc taken up by the water.

In order to confirm the suspicion that the presence of zinc, taken up by the water in its passage from the well to the commandant's house, might be responsible for the marked reduction in blood-heat organisms in general and in *Bacillus coli* in particular, the following series of experiments were undertaken:—

1. A sample of the well water was obtained with the usual precautions and brought direct to the laboratory where it was placed in the refrigerator for a short period (3–4 hours) intervening between its arrival and the setting out of the test. The average quantity of zinc found by former examinations of the water from the commandant's house, as shown in Table I., has been between 3 and 4·5 parts per 100,000. Thirteen tubes were set up containing quantities of zinc sulphate varying from 1 to 7 parts (of the metal) per 100,000, in gradations of 0·5 part—i.e., 1, 1·5, 2, 2·5 ..... 7. In each of these tubes 10 c.c. of the well water were placed. At the same time control agar plates were poured in order that the number of colonies developing in 48 hours at 37° C. might be accurately estimated for the sample on this particular occasion. The 13 tubes were then placed also at 37° C., and from each of them 1 c.c. was plated out in agar at the end of 24, 48, and 72 hours' contact, and counted 48 hours later, as in the control plate.

The objects of this experiment were, clearly, to see what effect, if any, the presence of definite quantities of a known salt of zinc might have on a water the bacterial content of which was known, and also to note whether more prolonged contact would increase the bactericidal effects, if present. The longest time during which the water in question could be in contact with the zinc being three days, this period was the limit employed in our experiments. The control plate yielded a count of 51 colonies, and the following Table III. gives the result of the test.

TABLE III.

Experiment 1.—Well water 10 c.c. and varying amounts of $ZnSO_4$. Control plates showed that the water contained 51 organisms per c.c. developing at 37° C. in 48 hours.

Quantity of zinc in parts per 100,000.	No. of colonies per c.c. developing in agar in 48 hours. After 24 hours contact.	After 48 hours contact	After 72 hours contact.	Quantity of zinc in parts per 100,000.	No. of colonies per c.c. developing in agar in 48 hours. After 24 hours contact.	After 48 hours contact.	After 72 hours contact.
1·0	7	0	0	4·5	1	0	0
1·5	6	0	4	5·0	0	0	0
2·0	6	0	1	5·5	0	0	0
2·5	3	0	0	6·0	0	0	0
3·0	1	0	1	6·5	1	1	0
3·5	5	0	2	7·0	1	0	0
4·0	2	0	2				

There is no need to elaborate the findings expressed in the table, the facts are eloquent in themselves.

2. The next experiment was as follows: A similar series of 13 tubes was prepared with the same increasing quantities of zinc sulphate, but in place of the natural well water, sterilised water was used, and a definite number of *B. coli* was added to each. A control plate of the sterile water and the *B. coli* was poured at the same time in order to give us an estimate of the number of organisms we were adding. It was our intention to add as nearly as practicable the same number of known organisms (*B. coli*) as there were bacteria developing at 37° C. in 48 hours from 1 c.c. of the well water sample. This latter, as stated above, proved to be 51; our control of the emulsion used showed 106 colonies, near enough to allow of comparable estimation.

Thus we had a series of tubes containing each 10 c.c. of sterilised water with approximately 100 *B. coli* organisms per c.c., and quantities of zinc varying from 1 to 7 parts per 100,000. These were placed in the thermostat at 37° C. as was done in Experiment 1, and plates were poured from each at the end of 24, 48, and 72 hours respectively. The plates were then incubated for 48 hours in each case and the numbers of colonies which developed were enumerated. The tabulated results are here given:—

TABLE IV.

Experiment 2.—Sterile water containing varying quantities of $ZnSO_4$ and a definite number of *B. coli*. per c.c.

Quantity of zinc in parts per 100,000.	No. of colonies per c.c. developing in agar in 48 hours. After 24 hours contact.	After 48 hours contact.	After 72 hours contact.	Quantity of zinc in parts per 100,000.	No. of colonies per c.c. developing in agar in 48 hours. After 24 hours contact.	After 48 hours contact.	After 72 hours contact.
1·0	62	0	0	4·5	5	1	0
1·5	280	0	0	5·0	4	0	0
2·0	149	0	0	5·5	3	1	0
2·5	158	0	0	6·0	1	1	2
3·0	72	1	1	6·5	4	0	0
3·5	57	1	0	7·0	4	0	0
4·0	8	0	1				

The high figures with tubes 2, 3, and 4 compared with 1 and 5 after 24 hours contact are probably due to accidental contamination when pouring the plates, especially since we notice that there was no growth from these same tubes after another 24 hours contact. This explanation is further substantiated by the fact that many of the colonies which grew on these plates were examined and found not to be *B. coli* at all, the only organism which had been added intentionally.

The noteworthy point, however, is the marked fall in the number of colonies developing from the tube containing 4 parts of zinc, which fall is maintained for the remainder of the series.

A question of autolysis of bacteria may be raised here, and there is no doubt that in the absence of any nutriment (the organisms having been added to sterilised water) a certain amount of autolysis must have occurred, but whether sufficient to reduce the original number to any appreciable extent was left for a subsequent experiment. But, even then, autolysis cannot account for the very remarkable reduction from 57 colonies developing from the tube containing 3·5 parts per 100,000 to 8 in that containing 4 parts. Further, it will be noticed that after contact for 48 hours only 5 of the tubes yielded any growth at all, and then only one colony.

3. As a control to this last a second series was put up a week later on the same lines with a similar culture, using varying amounts of metallic zinc (the sulphate being the salt employed) from 1 part to 5 parts per 100,000. The results of this are given below.

TABLE V.

Experiment 3.—Repetition of Experiment 2.

Quantity of zinc in parts per 100,000.	No of colonies per c.c. developing in agar in 48 hours. After 24 hours contact.	After 48 hours contact.	After 72 hours contact.	Quantity of zinc in parts per 100,000.	No. of colonies per c.c. developing in agar in 48 hours. After 24 hours contact.	After 48 hours contact.	After 72 hours contact.
1·0	65	3	0	3·5	0	0	1
1·5	15	0	0	4·0	2	0	3
2·0	41	0	0	4·5	0	0	0
2·5	59	1	1	5·0	0	1	0
3·0	21	1	0				

The only difference to note between these findings and the previous ones in that the drop in the first took place between 3·5 and 4 parts per 100,000, whereas in the latter it occurred at about 3 parts,

4. Our next experiment was arranged on lines somewhat similar to the last, but instead of varying the proportion of

zinc present, graded amounts of *B. coli* were added to the sterile water which contained the fixed quantity of 4 parts of zinc per 100,000 (i.e., the amount which has been found in water under investigation). The numbers of *B. coli* varied from 40 per c.c. in the first tube to 4000 in the last.

As in the previous experiments the tubes were placed at 37° C. and at the termination of 24, 48, and 72 hours plates were poured, and these after a further 48 hours incubation were examined and the numbers of colonies developing were counted.

TABLE VI.

Experiment 4.—To show the effects of the zinc on graduated numbers of *B. coli*, on the analogy of the previous experiments.

No. of *B. coli* per c.c.	No. of colonies per c.c. developing in agar in 48 hours.			No. of *B. coli* per c.c.	No. of colonies per c.c. developing in agar in 48 hours.		
	After 24 hours contact.	After 48 hours contact	After 72 hours contact.		After 24 hours contact	After 48 hours contact	After 72 hours contact.
40	7	0	0	800	102	0	0
200	103	3	—*	2000	189	0	0
400	69	0	0	4000	316	0	1

* Plate contaminated; overgrown by mould.

Undoubtedly here also the question of autolysis would come into consideration (VI.). In connexion with this experiment it is a point worth noting that the well water by previous analyses might show 50 colonies per c.c. or thereabouts, while that from the commandant's house on the same day had as few as 5 or 6, a reduction closely approximating that found by the experiment above.

With a view to elucidating the question as to the degree in which autolysis might be the cause of the reduction in Experiments 2 and 3, several series were put up, as in these experiments, but without any zinc, merely sterile water and *B. coli* in varying quantities, and estimated by the same method of incubating for 48 hours plates poured after the bacilli had been in the water for 24, 48, and 72 hours. The results were too variable to be worth recording; in some of the tubes there appeared to be but very little reduction at all within the times specified, while in others the numbers of organisms developing were considerably less, while yet again in others the plates showed some increase. The results of different experiments revealed different findings even with practically the same number of added organisms. There is no need, therefore, to give the details of these results; suffice it to say that in no instance was the reduction anything approaching that found in the zinc water experiments.

5. Finally, we considered that it would be instructive to use for experiment the water from the commandant's house with the zinc content in its natural state, instead of employing sterile water and artificially prepared $ZnSO_4$ solution. The water on this occasion yielded 4 colonies per c.c. growing in agar in 48 hours, and contained between 4 and 5 parts of zinc per 100,000. Varying numbers of *B. coli* were added as in Experiment 4, and plating was performed after further contact for 48 and 72 hours. The results obtained are presented in the following table:—

TABLE VII.

Experiment 5.—To show the effects of zinc in the water taken from the commandant's house after contact with varying quantities of *B. coli*.

No. of *B. coli* added per c.c.	No. of colonies per c.c. developing in 48 hours in agar.	
	After 24 hours contact.	After 72 hours contact.
20	2	0
100	35	0
200	47	0
500	55	1
1000	65	2

The times of contact were determined upon by the fact that the water as used is generally left for 24 hours and might conceivably be stored for as long as three days.

Summary and Conclusions.

1. During a period of two years a depôt of some 200 men has had as its sole supply a water proved to contain zinc in amounts varying from 2·5 to 4·72 parts of the metal per 100,000. No disturbance of health has resulted.

2. In one household the disappearance of a persistent condition of ill-health, attributed locally to a contaminated water-supply, coincided with the laying on of a water containing considerable quantities of zinc.

3. The number of organisms developing at blood heat from the well water is markedly greater than that found in the same water after it has taken up from 3 to 4 parts of metallic zinc per 100,000, and remained in storage for two days at most.

4. In order to ascertain whether or not this inhibitory effect on bacterial growth might be due to the zinc content of the water various experiments were undertaken.

5. From 3 to 4 parts of metallic zinc (as sulphate) appear to be sufficient, after 24 hours contact, to inhibit, if not destroy, coliform organisms in numbers considerably exceeding those likely to be found in any ordinary drinking supply (Experiment 2).

6. Even as small an amount as 1·5 parts of metallic zinc (as sulphate) per 100,000 renders such water practically sterile in 48 hours (Experiments 2 and 3).

7. The use of a water containing zinc naturally in solution as a carbonate shows analogous results, but, as would be expected, the reduction in the number of coliform organisms after the first 24 hours is not so great, though complete sterilisation appears to take place between 48 and 72 hours.

URBAN VITAL STATISTICS.

(Week ended June 23rd, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 12·4, against 12·7 and 12·8 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 12·2, or 0·1 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 4·7 in Wimbledon, 4·8 in Ealing, and 5·3 in Barnsley to 20·5 in Bury, 21·0 in South Shields, and 21·6 in West Bromwich. The principal epidemic diseases caused 316 deaths, which corresponded to an annual rate of 1·0 per 1000, and included 179 from measles, 54 from infantile diarrhœa, 42 from whooping-cough, 31 from diphtheria, 8 from enteric fever, and 2 from scarlet fever. The deaths from measles showed a further decline compared with the numbers registered in the three preceding weeks, and caused the highest annual death-rates of 4·3 in South Shields, 4·5 in Middlesbrough, 5·2 in Walsall, and 7·0 in West Bromwich. The 587 cases of scarlet fever and 1067 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 14 and 22 below the numbers remaining at the end of the previous week. Of the 4032 deaths from all causes in the 96 towns, 259 resulted from violence. The causes of 33 deaths were uncertified, of which 6 were registered in Birmingham and 3 each in London, Liverpool, Sunderland, and Rhondda.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 13·8, against rates declining from 17·0 to 14·7 per 1000 in the five preceding weeks. The 337 deaths in Glasgow corresponded to an annual rate of 15·7 per 1000, and included 35 from whooping-cough, 18 from measles, 7 from infantile diarrhœa, 3 from diphtheria, and 1 each from enteric fever and scarlet fever. The 72 deaths in Edinburgh were equal to a rate of 11·3 per 1000, and included 4 each from measles and whooping-cough, and 1 from diphtheria.

Irish Towns.—The 133 deaths in Dublin corresponded to an annual rate of 17·4, or 0·4 per 1000 less than that recorded in the previous week, and included 3 from measles and 1 each from scarlet fever and infantile diarrhœa. The 91 deaths in Belfast were equal to a rate of 12·1 per 1000, and included a fatal case of measles.

VITAL STATISTICS OF LONDON DURING MAY, 1917.

In the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the ten diseases specified in the table was equal to an annual rate of 3·5 per 1000 of the population, estimated at 4,237,287 persons; in the three preceding months the rates were 4·2, 4·4, and 3·7 per 1000 respectively. The lowest rates last month were recorded in Paddington, Hammersmith, the City of Westminster, Hampstead, and the City of London; while the highest rates were recorded in Shoreditch, Bethnal Green, Southwark, Bermondsey, Deptford, and Woolwich. Scarlet fever was rather more prevalent than it had been in the preceding month; among the several metropolitan boroughs the greatest proportional prevalence of this disease was recorded in St. Marylebone, Hackney, Finsbury, Shoreditch, Southwark, Bermondsey, Battersea, and Wandsworth. The Metropolitan Asylums Hospitals contained 613 scarlet fever patients at the end of last month, against 811, 785, and 712 at the end of the three preceding months; the weekly admissions averaged 92, against 102 and 93 in the two preceding months. The prevalence of diphtheria showed a decline from that recorded in other recent months; this disease was proportionally most prevalent last month in Stoke Newington, Holborn, Shoreditch, Bethnal Green, Poplar, Southwark, Bermondsey, Greenwich, and Woolwich. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1453, 1367, and 1206 at the end of the three preceding months, had further declined to 1048 at the end of last month; the weekly admissions averaged 129, against 165, 161, and 142 in the three preceding months. The prevalence of enteric fever was slightly in excess of that recorded in the preceding month; of the 39 cases notified during May, 5 belonged to Islington, 5 to Wandsworth, and 3 each to St. Pancras, Poplar, and Camberwell. There were 27 cases of enteric fever under treatment in the Metropolitan Asylums Hospitals at the end of last month, against 29 and 25 at the end of the

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING MAY, 1917.

(Specially compiled for THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1916.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.									
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.	Deaths from all causes.	Death-rate per 1000 living.
LONDON	4,237,387	—	464	655	—	39	3	15	212	44	4	1436	3·5	—	291	5	44	59	8	73	480	1·2	5632	13·9
West Districts:																								
Paddington	130,668	—	5	18	—	1	—	—	6	—	—	30	2·4	—	28	—	1	3	—	3	35	2·8	210	16·8
Kensington	152,144	—	17	18	—	2	—	—	2	2	—	41	2·8	—	41	1	2	4	1	3	52	3·6	237	16·2
Hammersmith	117,965	—	1	18	—	2	—	—	3	1	—	25	2·2	—	14	1	1	2	—	2	20	1·8	159	14·0
Fulham	149,423	—	17	24	—	2	—	2	4	1	—	50	3·5	—	14	—	1	2	1	5	23	1·6	186	13·0
Chelsea	57,298	—	8	2	—	1	—	—	2	1	—	14	2·5	—	—	—	—	—	1	2	3	0·5	80	14·6
City of Westminster	132,853	—	14	8	—	—	—	1	1	2	—	26	2·0	—	2	—	—	1	—	1	4	0·3	158	12·4
North Districts:																								
St. Marylebone	98,573	—	14	15	—	1	—	—	4	1	—	35	3·7	—	10	—	—	—	—	3	13	1·4	155	16·4
Hampstead	81,470	—	3	7	—	—	—	—	—	1	—	11	1·4	—	1	—	—	—	—	—	1	0·1	71	9·1
St. Pancras	196,812	—	12	25	—	3	—	—	11	2	—	53	2·8	—	23	—	2	3	1	3	32	1·7	297	15·7
Islington	309,359	—	24	35	—	5	—	—	12	2	1	79	2·7	—	13	1	—	6	—	5	25	0·8	385	13·0
Stoke Newington	49,776	—	3	11	—	—	—	—	3	1	—	18	3·8	—	7	—	1	2	—	—	10	2·1	78	16·3
Hackney	209,636	—	34	26	—	2	—	—	12	—	—	74	3·7	—	3	—	1	5	—	2	11	0·5	281	14·0
Central Districts:																								
Holborn	38,161	—	1	8	—	—	1	—	3	—	—	13	3·6	—	5	—	—	1	—	1	7	1·9	63	17·2
Finsbury	74,230	—	13	11	—	—	—	1	2	—	—	27	3·8	—	3	—	2	—	—	1	6	0·8	108	15·2
City of London	20,113	—	1	1	—	—	—	—	1	—	—	3	1·6	—	—	—	—	—	—	—	—	—	21	10·9
East Districts:																								
Shoreditch	99,932	—	16	21	—	2	—	1	14	2	—	56	5·8	—	3	—	3	4	—	4	14	1·5	152	15·9
Bethnal Green	115,552	—	15	26	—	1	—	—	13	6	—	61	5·5	—	11	—	2	—	—	6	19	1·7	145	13·1
Stepney	258,395	—	22	48	—	—	1	1	13	1	1	87	3·5	—	9	—	2	1	—	9	21	0·8	356	14·4
Poplar	155,095	—	12	34	—	3	—	—	10	1	—	60	4·0	—	15	—	3	4	1	2	25	1·7	240	16·1
South Districts:																								
Southwark	177,166	—	27	41	—	—	—	3	12	2	1	86	5·1	—	6	1	4	2	—	—	12	0·7	273	16·1
Bermondsey	113,661	—	23	41	—	—	—	—	6	—	—	70	6·4	—	11	—	2	—	—	6	19	1·7	175	16·1
Lambeth	283,729	—	28	51	—	2	1	—	12	1	1	96	3·5	—	17	—	1	4	—	3	25	0·9	340	12·5
Battersea	159,402	—	23	15	—	2	—	—	11	1	—	52	3·4	—	6	—	1	3	1	1	12	0·8	187	12·2
Wandsworth	310,858	—	48	34	—	5	—	1	13	4	—	105	3·5	—	10	—	4	3	—	2	19	0·6	334	11·2
Camberwell	249,749	—	33	41	—	3	—	2	9	1	—	89	3·7	—	17	1	4	4	1	3	30	1·3	330	13·8
Deptford	107,696	—	12	14	—	—	—	1	12	3	—	42	4·1	—	9	—	5	2	—	—	16	1·5	149	14·4
Greenwich	94,452	—	8	21	—	1	—	—	5	1	—	36	4·0	—	7	—	—	2	—	2	11	1·2	136	15·0
Lewisham	162,901	—	21	14	—	1	—	1	4	4	—	45	2·9	—	5	—	—	1	1	2	9	0·6	170	10·9
Woolwich	130,313	—	9	27	—	—	—	1	12	3	—	52	4·2	—	2	—	2	—	—	2	6	0·5	156	12·5
Port of London	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

two preceding months; the weekly admissions averaged 6, against 6 and 4 in the two preceding months. Erysipelas was proportionally most prevalent last month in Holborn, Shoreditch, Bethnal Green, Poplar, Southwark, Battersea, Deptford, and Woolwich. The 15 cases of puerperal fever notified during the month included 3 in Southwark, 2 in Fulham, and 2 in Camberwell. Of the 44 cases of cerebro-spinal meningitis, 6 belonged to Bethnal Green, 4 to Wandsworth, 4 to Lewisham, 3 to Deptford, and 3 to Woolwich; while the 4 cases notified as poliomyelitis belonged respectively to Islington, Stepney, Southwark, and Lambeth.

The mortality statistics relate to the deaths of persons actually belonging to the several metropolitan boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the five weeks ending June 2nd the deaths of 5632 London residents were registered, equal to an annual rate of 13·9 per 1000; in the three preceding months the rates had been 21·3, 18·3, and 18·2 per 1000 respectively. The death-rates last month ranged from 9·1 in Hampstead, 10·9 in the City of London and in Lewisham, 11·2 in Wandsworth, and 12·2 in Battersea; the highest rates were 16·1 in Poplar, in Southwark, and in Bermondsey, 16·2 in Kensington, 16·3 in Stoke Newington, 16·4 in St. Marylebone, 16·8 in St. Pancras, and 17·2 in Holborn. The 5632 deaths from all causes included 480 which were referred to the principal infectious diseases; of these, 291 resulted from measles, 5 from scarlet fever, 44 from diphtheria, 59 from whooping-cough, 8 from enteric fever, and 73 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded last month in the City of London; among the metropolitan boroughs they caused the lowest death-rates in the City of Westminster, Chelsea, Hampstead, Hackney, and Woolwich; and the highest rates in Paddington, Kensington, Hammersmith, Stoke Newington, and Holborn. The 291 deaths from measles were 111 in excess of the corrected average number in the corresponding period of the five preceding years; this disease was proportionally most fatal last month in Paddington, Kensington, Hammersmith, St. Pancras, Stoke Newington, and Holborn. The 5 fatal cases of scarlet fever were 16 fewer than the corrected average number, and included 1 each in Kensington, Hammersmith, Islington, Southwark, and Camberwell. The 44 deaths from diphtheria were equal to the corrected average, and included 5 in Deptford, 4 in Southwark, 4 in Wandsworth, 4 in Camberwell, 3 in Shoreditch, and 3 in Poplar. The 59 fatal cases of whooping-cough were 79 below the corrected average number, and included 6 in Islington, 5 in Hackney, and 4 each in Kensington, Shoreditch, Poplar, Lambeth, and Camberwell. The 8 deaths from enteric fever showed a decline of 3 from the corrected average, and belonged respectively to Kensington, Fulham, Chelsea, St. Pancras, Poplar, Battersea, Camberwell, and Lewisham. The 73 fatal cases of diarrhœa and enteritis among children under 2 years of age were 18 below the corrected average number; the greatest proportional mortality from this cause last month was recorded in Fulham, Shoreditch, Bethnal Green, Stepney, and Bermondsey. In conclusion, it may be stated that the aggregate mortality in London last month from these principal infectious diseases was 1·0 per cent. below the average.

BABY WEEK.—From July 1st to 7th special efforts will be made throughout the country to bring home to the people the pressing need for conserving child-life, and by means of processions, pageants, lectures, and exhibitions it is hoped that the movement, which has already produced such good results by the establishment of maternity and child welfare centres, may be still further extended. In London on July 2nd in the Guildhall a resolution defining the policy of Baby Week will be proposed. It will run as follows:—

> In view of the overwhelming necessity for saving infant life at a time of unparalleled drain on the manhood and womanhood of the nation, the citizens here assembled earnestly call for the cooperation everywhere of municipal and voluntary enterprise to secure the following objects and pledge themselves to do their utmost in their respective localities for the furtherance of the same: (1) a full-time health visitor, under the control of the local medical officer of health, for every 400 babies in the area; (2) an approved infant welfare centre within the reach of every working-class home; (3) ample facilities for the antenatal care of mothers; (4) medical supervision of children between two years and school age.

On the same day Her Majesty the Queen will open in the Central Hall, Westminster, a child welfare exhibition, where everything that concerns the practical nurture and training of the child will be exhibited to the eye, while a series of conferences will also take place dealing with midwifery, illegitimacy problems, the care of the unmarried mother and her child, and other cognate subjects. Sir Francis Champneys and Sir Robert Morant are among the chairmen, while the speakers will include Professor E. W. Hope, Dr. Janet Lane-Claypon, and Miss A. Gregory. One of the methods of propaganda which ought to be productive of good results is the prize essay scheme in connexion with the elementary schools, the subject for boys being "Why should I kill that fly?" and for the girls "How I mind our baby." The special attractions for provincial towns and villages include baby shows, perambulator parades, and exhibitions of various kinds relating to mothercraft. At the Heritage Crafts Schools, Chailey, Sussex, there will be a special demonstration of Montessori ideals in connexion with the Montessori Hospital School for Tiny Crippled and Suffering Children, when Mr. Robert Mond, the founder of the Infants Hospital, Vincent-square, London, will preside and Professor Cyril L. Burt will give a short address. The address of the Executive Council for Baby Week in London is 6, Hollesstreet, W. 1, and full information regarding the programme may be obtained from the secretary.

Correspondence.

"Audi alteram partem."

THE VARIATION IN THE SPECIFIC GRAVITY OF URINE AND ITS RELATION TO DISEASE.

To the Editor of THE LANCET.

SIR,—In the pressure of general or even special practice, the urinometer seems generally looked upon as a mere guide as to whether the physician is to go to the further trouble to test for sugar; and when this and albumin are absent and nothing is suspected which requires the skilled aid of the analytical chemist or the bacteriologist, other possible conditions are often either entirely neglected or are regarded as of little value as a further means to diagnosis. Such oversight is particularly to be deprecated with regard to so simple and valuable an aid as the systematic registration of specific gravities.

By long and careful observation I have come to the conclusion that urines of specific gravities below 1015, and in certain cases below 1030, extending over long periods are of more pathological importance than those containing a slight percentage of either albumin or sugar. In the former there is a greater or lesser retention of the toxins of katabolism or tissue waste, a retention which will vary with the specific gravity; in the latter, such toxins may be fully eliminated.

Nor may such low specific gravities always be the result of sclerotic kidney or of high blood pressure, but in many cases are probably due to kidneys neither diseased nor congested, but more or less functionally inactive to the elimination of any substances other than pure water, a condition which may be responsible for more chronic ailments and diseases of obscure etiology than is generally supposed.

The specific gravity 1015, which is generally considered normal and is usually passed over without question, is inadequate to carry off the toxins constantly accumulating in the systems of those who live too freely, and even double this figure would scarcely suffice to keep such cases in perfect health.

Children during convalescence from scarlet fever show little evidence of pathological change except in so far as albumin may appear in the urine. It is when the albumin has disappeared, and the child seems to have escaped all the after consequences of the fever, that the real mischief is taking place. It is at this period, not only in consequence of the disappearance of albumin, but also because of the diminishing quantity of normal urinary constituents, that the urine falls still lower in specific gravity and becomes practically negative to reactions, is frequently almost colourless, and, in fact, sometimes in that condition which mothers describe as—"beautiful, looks just as though it had come out of the tap."

It would thus appear that the more lasting injury caused by the toxins and high temperature of the preceding fever has fallen upon those cells in the kidney whose functions it is to exert a selective activity on the blood, and to eliminate the products of katabolism, and that these cells, mainly the tubular epithelium, after the excessive work which has been thrown upon them in the rapid katabolism of fever have now reached a stage of exhaustion or lowered vitality, and remain in this condition long after the glomeruli have recovered and the albumin has disappeared.

That the glomeruli should be the first to suffer injury and the first to recover seems difficult to explain, but the fact that albumin first appears in the urine and then disappears, followed by a diminution and sometimes an almost complete, or even an entire absence of those substances believed to be excreted by the tubular epithelium, seems plainly to indicate that such is the case.

But in the meantime metabolism is going on and the uneliminated products of katabolism are steadily rising in the blood, and their toxic effects will appear ere long—in one case as rheumatism, in another as chorea, or in another as an "-itis" somewhere in the tissues. The particular tissue selected for attack will, of course, be that one whose vitality has been most impaired by the previous fever, and this again will depend upon idiosyncrasy.

In scarlet fever cases such continued low specific gravities are lost sight of because they may not commence until after the child has returned to apparent health, and probably not until after the hospital is left, the discipline of which has given place to that indulgence at home which will naturally take place after the enforced absence, the free and careless diet hastening those changes in the kidney which often end in such disastrous consequences. Hence the importance of re-examination in these cases for months after convalescence, and careful living and dieting in the meantime.

The virus of scarlet fever is perhaps the best to take as an example of conditions which have a specific devitalising effect on the kidney cells, though it is possible that a vicious circle may be established by the katabolic toxins themselves, intensified by errors in diet, acting as a deterrent to the physiological activity of these cells by lowering their vitality—and this is probably the commonest cause in those cases where a specific toxin cannot be traced or where such toxin can no longer be considered to be in action.

It would thus appear that a group of associated disorders, such as those which result as the sequelæ of certain fevers, can be explained as originating from the same toxins—namely, the uneliminated products of katabolism.

Hence, such theory would be in accordance with the opinion of those writers who believe in the identity of the poisons, whatever these may be, setting up the rheumatism and chorea following scarlet fever, and including the affections of the tonsils and naso-pharynx under the same causative agent or agents would naturally relegate these as "avenues of infection" for only such toxins as those of the exanthemata or those of microbic origin. It is, however, possible that either tonsillar or dental toxins acting over long periods may exert a deleterious effect on the vitality of the kidney eliminative cells, and thus set up a vicious circle causing rheumatism and chorea and other ills much as the toxin of scarlet fever, which, though of shorter duration, is, of course, much the more virulent.

I am, Sir, yours faithfully,

Liverpool, June 21st, 1917. WILLIAM BRAMWELL.

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—Sir John Broadbent has given his impressions of some recent observations and conclusions of a small body of workers to whom, justly or unjustly, the term "new school" has been applied, and in the last sentence of his letter states that, "for the reasons given above I am unable to accept in its entirety the doctrine of auricular fibrillation." Considering this sentence with its full context, it may be that, in speaking of the "doctrine of auricular fibrillation," the reference is to the special conclusion that digitalis in this clinical condition has a very special action, but this point I leave aside for the moment. It is left to the reader to believe that Sir John Broadbent doubts the validity of the conclusion that fibrillation of the auricles, a well-known experimental condition, occurs in the human subject.

It is now seven years since I gave in full the evidence for the occurrence of fibrillation of the auricles in the human subject. The papers were published at a time when the cause of gross irregularity of the human ventricle was a matter of wide controversy, and they were published simultaneously with less exhaustive articles from workers in Vienna. I judge the effect of these papers as impartially as it is possible for me to do, and conclude that they carried conviction to all who were actively engaged in work upon the subject. The papers brought conviction because they contained an overwhelming weight of evidence, much of which has since been confirmed abundantly by other workers, and none of which has been called in serious question. At the present time the doctrine that auricular fibrillation occurs in the human being and is in man a common clinical condition is universally accepted by productive workers, and to me it seems superfluous to repeat the evidence, which is on available record. Judgment has been passed upon the conclusions by those who are competent to judge, and this judgment is entirely favourable: active workers who held other views of the causation of the condition abandoned those views when the new conclusion was formulated. No publication will shake the conclusion unless it records new facts directly which contradict it and

contains new and reasonable explanations of the manifold phenomena of the clinical condition so far described.

But it may be that Sir John Broadbent's reference is solely to the supposed specific action of digitalis. Upon this question his view is clearly stated: "It is not merely in auricular fibrillation that digitalis is of value. Any clinician knows the extraordinarily satisfactory results obtained from the administration of digitalis in cases of heart failure and dropsy associated with mitral incompetence, even when the pulse is quite regular and there is no question of 'auricular fibrillation.'" It is clear that if *one* clinician has such knowledge, digitalis has the action here credited to it. But the clinician must show the source of his knowledge; he must bring forward the evidence for his faith. In regard to digitalis, there is on record at the present time a large number of cases of auricular fibrillation in which the effects of the drug have been observed closely and in which the rate of the ventricle has been shown beyond doubt to be controlled by the drug. These observations have been conducted on scientific lines. There are few instances, probably no instances, in which a medicinal remedy has been more carefully explored in a given malady. Casual bedside observations are not to be weighed in the same scale. There is no comparable series in which, with a normal sequence of chamber contraction, digitalis has been shown to have a similar effect or, in fact, any striking beneficial effect. If Sir John Broadbent can compile such a series; if he can place on record a number of observations in which "extraordinarily satisfactory results" follow the administration of digitalis when the heart's action is regular; if he can show that these results come from the administration, and not from other factors in the patient's environment (as has been done in the case of those suffering from fibrillation), I for one will freely acknowledge that he has performed for mankind generally and for his fellow-practitioners a signal service. But the bald statement that it is so is valueless; the series is not now forthcoming, and until it is forthcoming the conclusion cannot gain acceptance.

When Sir John Broadbent discusses the meaning and effects of digitalis slowing in auricular fibrillation he shows that he is not conversant with the facts or with contemporary thought. He writes: "The irregularity of rhythm in the ventricle in auricular fibrillation is attributed, so far as I am aware without any sufficient evidence, to the irregular transmission of feeble, incoördinate stimuli from the flickering fibres of the fibrillating auricle, which one would not suppose capable of exciting a contraction in the ventricle. But even admitting this, how can the mere cutting off of a few nervous impulses from auricle to ventricle by itself restore the functional efficiency of a heart muscle which has broken down under stress?" Now it is true that the irregularity of the ventricle is attributed to irregularly transmitted impulses from the auricle; and for this there is very powerful, if not convincing, evidence. That these impulses are *feeble* is pure supposition; we have no knowledge of their strength and no right to suppose them to be feeble; yet this description, gratuitously introduced, becomes the main point of attack. That the impulses are nervous is similarly a gratuitous addition to the contemporary hypothesis; yet Sir John Broadbent complains that the "neurogenic doctrine has been exalted to a position of undue importance."

The "mere cutting off" of a few impulses has a restorative effect upon a ventricle working under stress precisely because it relieves that stress by slowing an accelerated ventricle. Sir John Broadbent can hardly deny either that the ventricle is slowed by digitalis when the auricle is fibrillating or that the efficiency of the ventricle is increased by a reduction of its accelerated rate. But yet he will have it that the beneficial action of the drug is not of this kind, but that it acts as a "pick-me-up" for the exhausted muscle. "Pick-me-up" is not a particularly precise term in speaking of cardiac functions, but it is to be gathered that an increase in the strength of the contractions or of the muscle tone is in his mind. In support of this view he quotes Professor Cushny. There is no evidence of either of these effects in the human heart, and the subject is dismissed in almost as many words by Professor Cushny. When Sir John Broadbent quotes Professor Cushny as having found the heart to be slowed "*by direct action on the muscle*," he should add that the author he quotes is referring to the special muscle of the auriculo-ventricular bundle and not to the muscle of the ventricle, and that the drug is supposed to act upon this special muscle, not as a "pick-me-up," but as a poison which depresses its power of conduction. The current explanation of digitalis slowing is that which I put forward in my original papers—namely, that it is the effect of heart-block produced in the A.-V. tissues. This conclusion has been accepted generally; it does not include the recently added hypothesis that the action is indirect through the vagi. That hypothesis is still very much *sub judice*, and constitutes, so it seems to me, the chief outstanding point upon which controversy is permissible. But the point will be settled when it is settled, not by argument, but by further observations.

In so far as there are two schools, an old and a new, in cardiology, there are two schools in the following sense. There is a small body of workers who spend their time and energies in the collection of new knowledge, a body of workers who insist upon proof to demonstration or an approach to that ideal. This school, if school it be, has been productive, some would say extremely productive, during the past few decades. There is, on the other hand, a large number of clinicians who speak and write largely upon questions of cardiac pathology, but who do not demand or seek exacting proofs, but are content, as far as these questions are concerned, with a more philosophic and therefore more indolent attitude. This school, if school it be, is sterile; it is sterile because of its method of thought and inquiry. This division of medical thinkers has always existed, always will exist, and between the two schools an undercurrent of opposition is inevitable; one reason of its being inevitable is that the worker who unearths new facts regards those facts as primarily his property; he has a special and deep interest in them; they are his own children; he resents their being mauled; he resents the scolding of those children by any childless neighbour who regards them as young ruffians who disturb his peace. Those who have children, from the intimacy of their knowledge of them and their surroundings, from their sympathy for them, are most competent to rear them; those who discover new facts are most competent, in most instances alone competent, to weave these facts into a harmonious setting in the mass of human knowledge.

I am, Sir, yours faithfully,

THOMAS LEWIS, M.D. Lond.

Military Hospital, Hampstead, June 24th, 1917.

AN ARMY MEDICAL RESERVE: A PROPHETIC PROPOSAL.

To the Editor of THE LANCET.

SIR,—On Dec. 8th, 1904, the *Times* published a letter from me on the subject of an Army Medical Reserve. The letter contained a scheme I promulgated for establishing "auxiliary military hospitals" in connexion with, and affiliated to, the great general hospitals throughout the Empire. The staff was to be furnished by the junior staff of each hospital whose name it would bear. The matter was placed before the War Office authorities and some correspondence ensued, but nothing was done. Lately the matter has come up again in a pamphlet by Sir J. K. Fowler, which you reviewed in your issue of June 2nd. This scheme is on all fours with my scheme (see the enclosed extracts from my letter to the *Times*). I am sure you will agree with me that it is interesting to-day to reproduce the views of more than 12 years ago, which are now being adopted. I am, Sir, yours faithfully,

GEORGE STOKER,
Major, R.A.M.C.

Q.A.M.H., Millbank, London, S.W., June 13th, 1917.

Extract of a Letter entitled, "An Army Medical Reserve," published in the "Times" on Dec. 8th, 1904.

Where, then, it may be asked, are the right men to be found—men of suitable age, with requisite knowledge and practice, with an up-to-date training, those who have no ties, domestic or professional, which would prevent them being called up suddenly for service? They are to be found in connexion with every general hospital throughout the Empire, especially those that have medical schools and nursing homes attached to them. There are always to be found connected with such institutions a number of fully-qualified men who have lately occupied the posts of house physician or house surgeon, or who are acting as demonstrators, or assistants in the out-patient or other departments, who, to use a medical phrase, "are waiting for the wards." These and some senior medical students are the class of men required in the work. They are all known to one another, are picked men who have the honour and credit of their school and hospital very much at heart.

The nurses will be found in the same place with the necessary qualifications and surroundings. The orderlies could be recruited from the St. John trained orderlies in the district around the hospital.

The scheme for an Army Medical Reserve that I proceed to outline consists in the organisation of a system which shall embrace a number of units called civilian auxiliary hospitals, to be set on foot in times of peace and called out for service in times of war and stress. These hospitals would be organised in connexion with, and affiliated to, the general hospitals throughout the Empire. Such institutions would afford an ample and continuous supply of efficient physicians, surgeons, and nurses.

It would perhaps simplify matters if I describe shortly the formation of such a unit in connexion with a London general hospital. Let us call it St. George's Civilian Auxiliary Hospital No. 1. It is suggested that each hospital should be organised and equipped to contain 200 beds, but be capable of expansion to accommodate nearly twice that number. It is a universal experience that medical and surgical work in time of war comes in rushes, either during epidemics or after great battles, and for this reason it is absolutely necessary that hospitals should be capable of expansion.

THE SIGNIFICANCE OF CAPILLARY MARKINGS IN PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—In THE LANCET of March 4th, 1916, I called attention to the significance of certain red surface-markings in the neighbourhood of the upper dorsal vertebræ and their relation to pulmonary tuberculosis. I now have further figures to offer.

Notes of 481 consecutive cases were taken, all of which have been notified to their respective sanitary authorities. 130 were seen in the out-patient department of the Manchester Northern Hospital for Women and Children, the cases over 15 years of age being females.

	Ages in years.		
	Under 6.	6–14.	Over 15.
Showing marks	25 ...	59 ...	21
,, none	3 ...	17 ...	5
	28 ...	76 ...	26

80 per cent. therefore of the tuberculous out-patients showed markings.

Notes of 351 consecutive cases were taken at the Glossop and Chinley Tuberculosis Dispensaries and include in each age-group both sexes. The cases were sent to the dispensaries by their own doctors or by the school medical officers, or were contacts. 288 showed no tubercle bacillus to the usual examination, and 63 were returned as positive.

	Ages in years.			
	Under 6.	6–14.	15–19.	Over 20.
Showing markings	14 ...	92 ...	18 ...	68
,, none	7 ...	55 ...	22 ...	75
	21 ...	147 ...	40 ...	143

The 63 cases which showed tubercle bacillus in the sputum are classified as folllows:—

	Ages in years.			
	Under 6.	6–14.	15–19.	Over 20.
Showing markings ...	1 (dead) ...	4 ...	1 ...	17 (1 dead)
,, none	2 ...	4 ...	2 ...	32 (11 dead)
	3 ...	8 ...	3 ...	49

Of the whole number, 57 per cent. showed the markings and 43 per cent. have no markings, whilst in those who were returned as having the tubercle bacillus in the sputum 36 per cent. had markings and 64 per cent. had none.

The incidence of the death-rate is three times as great in those free from the markings compared to those showing markings. I am, Sir, yours faithfully,

Manchester, June 21st, 1917. R. CRAWSHAW HOLT.

THE TREATMENT OF TONSILLAR INFECTION.

To the Editor of THE LANCET.

SIR,—In your issue of June 2nd Dr. F. J. Poynton rightly draws attention to the large part that tonsillar infection plays in rheumatism. The prevailing opinion, at any rate with regard to the etiology of the more chronic forms, is to consider them primarily due to sepsis of the teeth. How often the tonsils get overlooked it is impossible to hazard. It is surprising, when a routine examination is made, from how many tonsils purulent matter may be exuded. The tonsils are commonly regarded as filters which deal with the organisms of the mouth. Once they have become a cesspool their use as natural immunisers has gone and radical enucleation would seem to be the only course to pursue. The body thus loses a most valuable protective organ, which not even the prolonged use of a vaccine of the predominant organism, usually a short streptococcus, will entirely make good.

But the question arises, Is there no means of saving the tonsils? Dental surgeons are now making efforts to cope with pyorrhœa in order to save the teeth. Can no means be found to save the tonsils? With this object in view I have recently been making use of a Bier's cupping apparatus, specially adapted for tonsil application. With a little practice it can be readily applied, and though very uncomfortable the patient soon gets accustomed to its use and can even learn to apply the instrument himself. It is surprising with what ease by this means pus can be squeezed out from the tonsils. The method, systematically and regularly applied, should do much to cleanse badly infected tonsils and give them a chance of recovering their normal powers. In several instances patients have quickly realised the relief afforded and have been only too anxious to continue the treatment.

At the present moment scores of soldiers are being thrown out of action by subacute and chronic rheumatism, some few of whom become hopeless cripples. In order that physical and thermal treatment should be used to the best advantage the early and vigorous treatment of sepsis wherever it lies should be thoroughly undertaken, and no advantage should be made of the fact that spontaneous subsidence of the septic focus will very often occur, for just as often it does not, and constant recurrences of rheumatism are only too common after apparent cure in patients whose throats, sinuses, or other foci apparently, but do not really, clear up. I am, Sir, yours faithfully,

Bath, June 20th, 1917. G. HELY-HUTCHINSON ALMOND.

SEROUS IRIDO-CYCLITIS.

To the Editor of THE LANCET.

SIR,—In the report in your issue of June 23rd of the meeting of the Section of Ophthalmology of the Royal Society of Medicine not one word is mentioned of what I for many months past have looked upon as one of the prime factors in the causation of those cases of serous irido-cyclitis (keratitis punctata, &c.) which, through the admirable and thorough work of Mr. W. Lang and others, have been—and I consider correctly—put down as frequently the result of pyorrhœa alveolaris. This complaint, serous cyclitis, is common enough in both sexes, but, in my experience, is far more frequently met with in the female, and at any age, roughly speaking, between 35 and 65; it is not found in very young or very old and edentulous people. Women certainly outnumber men, yet that would not account for the difference in the proportion affected; they pay quite as much attention to their teeth as the opposite sex, yet they more frequently fall victims to this serious complaint—and it is a very serious one. Why is this? It is not due to a less-resisting power of the female sex, nor to any idiosyncrasy thereof, but the missing link is constipation, and of that I have no manner of doubt, no possible doubt whatever. Women are far more constipated than men; they are more sensitive on the matter, and do not like to be seen repairing to, or issuing from, lavatories; they from early girlhood often neglect themselves in consequence. Again, they take less exercise, drink less fluid, are more careful and finicking in their diet, avoiding coarse foods more than we do, and—except in the case of the modern young lady—they smoke less or not at all; all this conduces to a sluggish state of the bowels. So, consequently, ptomaines—or whatever they are—passing in equal degree into the alimentary canals of both sexes, stand a much better chance of being absorbed into the lacteals or blood-vessels of the gut and "coming out in the eyes."

This theory fits in with practical experience, for all these patients are constipated, both men and women, some of them very much so; or, if they say their bowels are regular and act daily, the motions will be found dry and hard, absorption of the more fluid part having taken place. The treatment, therefore, is comparatively simple: whatever one treats one must not neglect the bowels, the teeth, or the

tonsil crypts; magnesia or soda should be given every morning in plenty of hot water or hot tea, the first thing on rising; if in water, the juice of half a lemon or a few grains of powdered ginger make it more palatable and prevent griping. These patients are greatly benefited by this plan of campaign and their feeling of well-being as the bowels get to act daily is pronounced.

Serous irido-cyclitis—as Mr. Lang has pointed out—may come from almost any source of septic absorption, and I have recently been treating a married lady with this complaint who had a vaginal discharge with ulceration of the cervix as the only likely cause; and in another very interesting case in a man the *fons et origo malorum* seemed to be septic absorption from very badly ingrowing toenails, the matrix thereof being in a foul and ulcerated state; the removal of the offending nails was rapidly followed by improvement and cure. I am, Sir, yours faithfully,

Norwich, June 26th, 1917. S. JOHNSON TAYLOR.

PUBLIC HEALTH APPOINTMENTS.

To the Editor of THE LANCET.

SIR,—Many people interested in public health regret that at a time when the Ministry of Health is under consideration there is apparently an absence of any attempt to prevent the continuation of the evils of the past *régime*—notably, the absence of coördination of effort and the multiplication of minor public health "specialist's" posts—blind-alley occupations. The Council of the Society of Medical Officers of Health has pronounced against such posts, and yet advertisements are continually appearing for whole-time medical officers for child-welfare centres. The prospects held out by such appointments must at present and for some considerable time yet be unsatisfactory, not only from a financial but also from a clinical point of view. Although the salary offered is adequate for a recently qualified practitioner, yet it will not be sufficient in a few years when the medical officer finds it does not lead to a more highly remunerated post and has lost valuable years during which a private practice could have been built up. It cannot be reasonably urged that these appointments are similar to those of resident medical officers to hospitals and that they afford an excellent training for private practice. The clinical interest of child-welfare work, although considerable, is limited. Much better work will be done by a medical officer who has an opportunity of carrying out other public health work as well, especially the medical inspection of school-children—an arrangement essential for the adequate coördination of the work carried out for children.

At the present time, when there is a shortage of civilian medical practitioners, it would seem advisable to arrange for this work to be carried out temporarily by general practitioners over military age. This course would have the important advantage of not penalising the large number of medical officers already in public health who have left their homes to serve with the forces. When the Public Health Service is being built up, who will see that these men are not forgotten? I am, Sir, yours faithfully,

June 24th, 1917. EFFICIENCY.

*** There is a strong feeling that no new civil appointments should be permanently filled while the war is in progress.—ED. L.

THE LANCET, VOL. I., 1917: THE INDEX.

THE Index and Title-page to the volume of THE LANCET completed with the issue of June 30th will be ready in July. Owing to the continued shortage in the paper-supply, the Index will not be issued with all copies of THE LANCET, as was the custom prior to the War. Subscribers who bind up their numbers are requested to send a post-card to the Manager, THE LANCET Office, 423, Strand, London, W.C. 2, when a copy of the Index and Title-page will be supplied free of charge.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Capt. C. A. Whittingham, R.A.M.C., attached Royal Fusiliers, qualified at Glasgow in 1916, and thereupon joined up.

Capt. S. Pool, M.C., R.A.M.C., attached Leicestershire Regt., qualified at Liverpool early in 1916, and shortly afterwards joined the R.A.M.C. The award of the Military Cross was announced in THE LANCET of Dec. 2nd, 1916, p. 959.

Died.

Lieut.-Col. F. W. H. D. Harris, R.A.M.C., was educated at University College, London, and qualified in 1880. He held appointments at the West Kent General Hospital, Maidstone, and at Teignmouth Infirmary, and was secretary of the R.A.M.C. Fund and Benevolent Society.

Capt. J. Neligan, R.A.M.C., qualified in Ireland in 1915, and joined the R.A.M.C. shortly afterwards.

Capt. F. H. Knaggs, R.A.M.C., was a student at Guy's Hospital, and qualified in 1887. He had held appointments at Gloucester Infirmary, at Guy's Hospital, and at Leeds Infirmary, and was in practice at Huddersfield. On joining the R.A.M.C. he became ophthalmic and aural surgeon at the Huddersfield Infirmary and War Hospital.

Wounded.

Capt. G. W. Armstrong, R.A.M.C., attached N. Staffs. Regt.
Capt. S. K. McKee, R.A.M.C.
Capt. C. A. Webster, R.A.M.C.
Capt. E. R. Mackay, Aust. A.M.C.
Capt. N. Prior, N.Z.M.C.
Capt. G. W. Watson, R.A.M.C., attached R.F.A.
Capt. C. D. Coyle, R.A.M.C., attached Hamps. Regt.
Capt. G. S. Glass, R.A.M.C., attached Hamps. Regt.
Capt. J. C. G. Glassford, Aust. A.M.C.
Capt. C. M. Samson, Aust. A.M.C.
Capt. E. B. Thomas, Aust. A.M.C.
Capt. R. C. Winn, Aust. A.M.C.
Capt. R. P. Smith, R.A.M.C., attached R. Lanc. Regt.
Capt. J. G. Sweeney, Aust. A.M.C.
Capt. C. J. L. Patch, R.A.M.C., attached R. West Surrey Regt.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported:—

Capt. E. N. Nicholson, Hussars, died from illness contracted in France, only son of Dr. A. Nicholson, of Brighton.

Second Lieut. W. H. G. Compton, Royal Field Artillery, killed in action, eldest son of Capt. W. H. Compton, R.A.M.C., of Brighton.

Second Lieut. W. A. Menzies, Royal Garrison Artillery, died of wounds, only son of Dr. J. A. Menzies, of Folkestone.

Second Lieut. C. D. N. Caleb, Devonshire Regt., killed in action, son of Dr. C. C. Caleb, Professor of Physiology, Medical College, Lahore, India.

Lieut. R. M. Herron, R. Sussex Regt., died of wounds, eldest son of the late Dr. J. Herron, of Green Lanes, London.

Capt. P. C. Taylor, London Regt., previously reported missing, now officially presumed killed, fourth son of the late Dr. H. Taylor, of Kennington, London, S.E.

Second Lieut. J. W. Spanton, Rifle Brigade, died of wounds, third and only surviving son of Mr. W. D. Spanton, F.R.C.S., of Hastings, and formerly of Hanley, Staffs.

Capt. A. F. Gulland, The Buffs, died of wounds, only surviving son of Surgeon-General A. D. Gulland, of Cheltenham.

Capt. F. L. Davy, Australian Imperial Forces, killed in action, only son of Lieut.-Col. H. Davy, C.B., R.A.M.C., of Exeter.

Second Lieut. H. B. Graham, Black Watch, killed in action, younger son of Lieut.-Col. R. B. Graham, V.D., R.A.M.C., of Leven, Fife.

FOREIGN DECORATIONS.

The following decorations have been conferred upon members of the staff of the Hôpital Auxiliaire 301, Royaumont, by the President of the French Republic:—

Médaille d'honneur des Epidémies en Or.—Miss Ivens, M.B., M.S. Lond., chirurgien-en-chef.

Médaille d'honneur des Epidémies en Vermeil.—Miss R. Nicholson, M.B., B.S. Dunelm, Mrs. J. A. Berry, M.B. Lond., Miss M. Ross, M.B., Ch.B. Glasg., Miss M. Wilson, M.B., Ch.B. Edin., chirurgiens; Mrs. Savill, M.B., Ch.B. Glasg., radiologiste; Miss E. Courtauld, L.S.A. Lond., anesthésiste.

OBITUARY OF THE WAR.

WILLIAM GORDON CUMMINGS, M.B., B.S. R.U.I., D.P.H.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain W. G. Cummings, who was killed in action last month, at the age of 36 years, was a native of Dungannon, co. Tyrone. Educated at Queen's College, Belfast, he graduated in 1903 M.B., B.S. of the Royal University of Ireland, obtaining later the Diploma in Public Health. After a resident appointment at the Richmond Hospital, Dublin, he settled in practice at Hanwell, where he had been for 12 years before joining the R.A.M.C. Territorial Force in January, 1915. He was struck by a shell which exploded in the dug-out in which he was attending to the wounded. His senior officer writes of Captain Cummings as a man on whom he placed the greatest reliance, who was always cheery under the most adverse circumstances.



WILLIAM TRENGWEATH HARRIS, M.R.C.S. ENG.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant W. T. Harris, who was killed on April 15th on the transport *Cameronia* in the Eastern Mediterranean, was 40 years of age, and the son and grandson of medical men, his father having been medical superintendent of Norwich City Asylum, and his grandfather in practice at Redruth, Cornwall. He was educated at Norwich Grammar School, taking his medical course at St. Thomas's Hospital and qualifying in 1903. After holding an appointment as assistant medical officer at Wakefield Asylum he settled in private practice in Chiswick, where he had a large panel practice, which sometimes employed 15 or 16 hours of his time daily. In February of this year he received his commission in the Royal Army Medical Corps and was sent to Egypt, which he was destined never to reach.



A fellow practitioner writes of Lieutenant Harris as a true friend and colleague, and one who devoted himself with great unselfishness to his poorer patients, supplying them in case of need with food and clothing as well as medicine. He was a well-grounded anatomist and sound practitioner, never at a loss in an emergency, extremely kind, gentle, sympathetic, and considerate. Apart from his professional attainments, he was a born musician and accomplished violinist, a cultured gentleman, and a fluent French scholar, so much so that his house was from the first open to Belgians in distress who could not converse in English—indeed, one of these, a chemist, resided with him nearly a year, and subsequently corresponded with him from France.

ARCHIBALD McKERROW RUSSELL, M.B., CH.B. GLASG.,

SURGEON, ROYAL NAVY.

Surgeon A. McK. Russell, who was reported missing, feared drowned, on the s.s. *Highland Corrie* sunk on May 16th, was 26 years of age, and son of Thomas Russell, of Newmains, Lanark. He was educated at Newmains School and Hamilton Academy, taking his medical course in Glasgow University, where he graduated in 1914. He held a resident appointment at the Western Infirmary, and at the beginning of August, 1914, he became a surgeon in the Royal Navy, serving for more than two years on the *Macedonia*, in which he was present at the Falkland Islands engagement. After having given up an earlier passage to a colleague he was returning for his second period of leave when the steamship on which he sailed was torpedoed. The boat on which he was being lowered capsized and he was last seen attempting to save a fellow passenger with her baby. His friend who reached this country safely tells of his keenness on his work and acute observation of life which tended greatly to mitigate the extreme monotony of their life at sea and its routine duties. Surgeon Russell was a keen cricketer.



GURTH SWINNERTON BLANDY, M.D., CH.B. EDIN.,

MILITARY CROSS,
CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain G. S. Blandy, who died on active service on April 24th at the age of 38, was the third son of Colonel W. P. Blandy, Royal Artillery. Educated at Sheffield Royal Grammar School and Edinburgh University, he graduated M.B., Ch.B. in 1902 and M.D. in 1912. While a student at Edinburgh University he was a member of the Volunteer Artillery, serving as a combatant in the South African War with the Imperial Yeomanry, when he was invalided with enteric fever. After graduating he filled resident posts at the Scarborough and Norfolk and Norwich Hospitals. On the outbreak of war he was senior assistant medical officer to the Middlesex County Asylum at Napsbury, where he had served from the opening of the asylum in 1905. He at once joined the Royal Army Medical Corps, serving first at home, then in Egypt and through the whole of the Gallipoli campaign, and finally in France. He was awarded the Military Cross in Gallipoli for "attending French and British wounded without cessation from 11 P.M. on 1st until midday on 2nd May, 1915, under rifle fire the whole time." He received shell-wounds on April 23rd to which he succumbed on the following day.



Captain Blandy's superior at Gallipoli writes of him as "first-class at his job; he never spared himself in any way"; while a combatant officer alludes to his loss as that of an old and staunch friend: "He never spared himself in his care of us, and it was indeed due to this unselfish habit of his that he came by the wound which resulted in his death." His chief at the County of Middlesex War Hospital, Napsbury, endorses this view of Captain Blandy.

ANOTHER RED CROSS HOSPITAL IN DUBLIN.

Arrangements are being made by the joint committee of the St. John Ambulance Association and the Co. Dublin Branch of the British Red Cross Association to equip and maintain another voluntary Red Cross hospital in Dublin. Premises have been secured at Glasnevin, and the preparatory work is nearly complete. The hospital will accommodate some 250 beds. It will be in surgical charge of Mr. Seton Pringle, surgeon to Mercer's Hospital, who has worked for several months in the Urgency Cases Hospital at Revigny.

In view of the present difficulty of transporting the wounded to Ireland, and the consequent fact that for several months past there has been an excess of hospital accommodation for soldiers in Dublin, the enterprise of opening a new Red Cross Hospital in Dublin requires some justification, for the managers of the Dublin Castle Red Cross Hospital, which has been working since early in 1915, cannot obtain ready and sufficient voluntary subscriptions.

THE subscriptions which have been given in connexion with the Scottish Blinded Sailors' and Soldiers' Hostel, Newington House, Edinburgh, now amount to £13,565.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments have been notified:—Deputy Surgeon-General O. W. Andrews to *New Zealand*. Fleet-Surgeon P. M. May to *Pembroke*, additional, for East London Recruiting District.

ARMY MEDICAL SERVICE.

Temp. Col. J. W. Bridges, Canadian A.M.C., vice Col. G. S. Rennie, and Temp. Col. H. A. Chisholm, D.S.O., Canadian A.M.C., vice Lieut.-Col. C. A. Peters, to be Assistant Directors of Medical Services.

Temp. Major F. B. Carron, Canadian A.M.C., to be Deputy Assistant Director of Medical Services.

Temp. Col. H. G. Barling (Lieut.-Col., R.A.M.C., T.F.), relinquishes his temporary commission on re-posting.

TERRITORIAL FORCE.

Lieut.-Col. H. Collinson, D.S.O., to be temporary Colonel whilst holding the appointment of Assistant Director of Medical Services.

Capt. A. Ramsbottom to be Deputy Assistant Director of Medical Services.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. O. L. Robinson, C.M.G., to be Brevet-Colonel on appointment as an Honorary Physician to the King.

Major R. B. Hole relinquishes the acting rank of Lieutenant-Colonel on re-posting.

D. B. King to be temporary Major whilst serving with the Horton (County of London) War Hospital.

Capt. L. R. Meech, M.C., to take rank and precedence as Captain as if his appointment to that rank bore date April 21st, 1917.

Temp. Capt. O. E. Farley, C.A.M.C., to take rank and precedence in the Corps and in the Army as if his appointment as temporary Captain bore date April 30th, 1917.

To be temporary Captains: Temp. Lieut. M. S. Fraser, M. H. Paterson, J. H. White, and Temp. Lieuts. L. J. O'Donovan, W. H. Marshall, T. G. Featherstonhaugh, J. Harvey, E. G. Saunders, J. Neligan, J. E. Ashby, A. Buchanan, W. L. O'Neill, J. L. Falconer, H. M. Jackson, J. P. Crawford, A. R. C. Doorley, R. M. de Mowbray, E. L. K. Sargent, W. Macadam, T. G. Evans, D. J. Harries, S. A. Burn, J. Keyms, E. H. Price, T. L. Jones, J. Cairns, W. G. Marsden, G. N. Brandon, A. M. A. James, A. E. Goldie, H. H. Fairfax, S. G. J. Dowling, F. Simpson, T. F. Wilson.

J. A. Gibb, late temporary Captain, to be Honorary Captain.

Officers relinquishing their commissions: Temp. Major R. C. Tweedy (on account of ill-health). Temp. Capts.: H. H. K. Sparrow, J. R. Robertson, J. E. Phillips, A. R. Roche, D. F. Kennard, E. E. Frazer, C. Coventry, C. H. Armitage, T. H. Phillips, H. Crichton. Temp. Lieut. C. W. Gittens (on account of ill-health).

SPECIAL RESERVE OF OFFICERS.

Major James C. Furness to be acting Lieutenant-Colonel whilst commanding troops on a hospital ship.

Lieut. (on probation) J. K. R. Landells is confirmed in his rank.

Lieutenants to be Captains: A. G. P. Wills, R. W. H. Miller, L. A. B. Moore.

To be Lieutenants: J. I. Keen (from University of London Contingent O.T.C.), D. Henegan (from Durham University Contingent O.T.C.), S. T. Alexander, C. G. G. Winter.

TERRITORIAL FORCE.

Lieut.-Col. F. Marsh is seconded whilst holding the appointment of Assistant Director of Medical Services.

Major J. E. H. Sawyer to be acting Lieutenant-Colonel whilst holding the appointment of Administrator.

Hon. Capt. F. C. Bentz (late Capt.) to be Captain, with precedence as from April 1st, 1915.

Capt. A. Ramsbottom is seconded whilst holding the appointment of Deputy Assistant Director of Medical Services.

Capt. J. M. A. Costello, to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Lieut.-Colonel H. Collinson, D.S.O., is seconded whilst holding the appointment as Assistant Director of Medical Services.

Officers seconded for duty with a General Hospital: Capts. H. W. Wilson, J. H. Thursfield, and N. S. Finzi; Lieut.-Cols. E. M. Callender and T. W. Westmacott; Majors F. J. Steward and J. H. Ray; Capts. W. S. Colman, F. D. S. Jackson, and M. Horne; Major G. N. Biggs; Capts. E. R. Carling, A. J. Jex-Blake, D. H. de Souza, G. A. Ewart, J. Everidge, D. Douglas-Crawford, J. Hay, H. Armstrong, C. T. Holland, V. C. de Boinville, W. C. Oram, G. M. Benton, G. E. Loveday, J. Wharton, F. E. Tylecote, and R. Ollerenshaw.

Lieut. A. C. Smith to be Captain, and to remain seconded.

Attached to Units other than Medical Units: Lieut. B. T. L. Glover to be Captain.

VOLUNTEER CORPS.

Durham Volunteer Regiment (9th Battalion): N. Philipson to be temporary Lieutenant and Medical Officer.

Northern Counties Highland Volunteer Regiment (1/1st Battalion): D. McFadyen (Surgeon-Lieutenant-Colonel, late Cameron Highlanders), to be temporary Captain and Medical Officer.

INDIAN MEDICAL SERVICE.

The King has approved of the retirement of Brevet-Colonel Sir Bruce Seton, Bart. (in consequence of ill-health).

CANADIAN ARMY DENTAL CORPS.

Temp. Major A. L. Johnson, from a Canadian Infantry Battalion, to be temporary Captain.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

Surgery.—J. Hollings (Sections I and II.), London Hospital; and C. A. Mortlock-Brown (Sections I. and II.), Royal Free Hospital.

Medicine.—W. A. Bibby, Manchester; C. A. W. Chapman (Section I.), Sheffield; S. C. Ho (Section I.), Cambridge and London Hospital; C. de C. W. Langdon (Sections I. and II.), Manchester; G. W. Pratt (Sections I. and II.), Cambridge; and C. Segal (Section II.), Berne.

Forensic Medicine.—W. A. Bibby, Manchester; A. G. Curzon Miller, Middlesex Hospital; and G. R. Sharp, London Hospital.

Midwifery.—D. C. Clark, King's College Hospital; E. W. Diggett, Jefferson College, Philadelphia; L. Dinerstein, London Hospital; and A. Magill, Guy's Hospital.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: W. A. Bibby, J. Hollings, C. de C. W. Langdon, and C. A. Mortlock-Brown.

VICTORIA UNIVERSITY OF MANCHESTER.—At an examination held in June the degree of M.D. (with commendation) was conferred upon W. Howarth Parkinson.

CENTRAL MIDWIVES BOARD.—Special meetings of the Central Midwives Board were held at Queen Anne's Gate Buildings, Westminster, on June 19th and 20th, with Sir Francis H. Champneys in the chair. A number of midwives were struck off the Roll, the following charges, amongst others, having been brought forward:—

Being in attendance as a midwife at a confinement and the patient suffering from abdominal swelling and tenderness, the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 21 (4); the patient being in the condition aforesaid, the midwife did not hand to the husband or the nearest relative or friend present the form of sending for medical help, properly filled up and signed by her, in order that this might be immediately forwarded to the medical practitioner, as required by Rule E. 20, and medical aid having been sought for the patient she neglected to notify the local supervising authority thereof, as required by Rule E. 22 (1) (a). The midwife neglecting to take and record the pulse and temperature of the patient at each visit, as required by Rule E. 14; advising the patient to mislead the officers of the local supervising authority by abstaining from giving them information as to the condition of the patient; not being scrupulously clean in every way, as required by Rule E. 2; and not keeping her register of cases, as required by Rule E. 24. When attending a patient the midwife neglecting to wear a clean dress of washable material, and a clean washable apron or overall, as required by Rule E 2; neglecting to disinfect her hands and forearms on each occasion before touching the generative organs of the patient, as required by Rule E. 4; and neglecting to swab the patient's external parts with an efficient antiseptic solution before making the first internal examination, as required by Rule E. 8. Being in attendance at a confinement and the child suffering from inflammation of and discharge from the eyes and continuing so to suffer, the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 21 (5). Having been in contact with a person suffering from a condition supposed to be infectious, the midwife neglected to notify the local supervising authority of the fact, as required by Rule E. 6, and having been suspended from practice by the local supervising authority, in accordance with Section 8 (3) of the Midwives Act, 1902, and Rules F. 1 and 2 of the Regulations of the Central Midwives Board, she nevertheless disregarded the suspension and continued to practise as a midwife without having undergone disinfection to the satisfaction of the local supervising authority, as required by Rules E. 6 and F. 2. A midwife fraudulently procuring the burial of two infant children by falsely representing that the contents of a box were truthfully described in a certificate made and written by her, whereas in truth and in fact the said box contained the bodies of two infant children as well as the body of a stillborn child, as she well knew, and that therein she was guilty of misconduct

within the meaning of Section 3, V. of the Midwives Act, 1902. A midwife being herself liable to be a source of infection from a septic finger, she attended a patient without having undergone the disinfection required by Rule E. 6; being liable to be a source of infection as aforesaid, she neglected to notify the local supervising authority, as required by Rules E. 6 and 22 (1) (e); she neglected to disinfect her hands and forearms on each occasion before touching the patient's generative organs, as required by Rule E. 4, and in disregard of Rule E. 8 she neglected to wash the patient's external parts with soap and water and to swab them with an efficient antiseptic solution (1) after the termination of labour; (2) during the lying-in period when washing was required. In contravention of the provisions of Section 1 (4) of the Midwives Act, 1902, the midwife employed her daughter, an uncertified person, as her substitute, to visit a patient during the latter part of the puerperium. The midwife not giving every reasonable facility to the local supervising authority for the inspection of her register of cases, bag of appliances, &c., and her place of residence, and an investigation of her mode of practice, as required by Rule E. 25. Being in attendance at a confinement and one of the twin children being stillborn, no registered medical practitioner being in attendance at the time of birth, the midwife neglected to notify the local supervising authority thereof, as required by Rule E. 22 (1) (c); the other twin child suffering from dangerous feebleness, she did not explain that the case was one in which the attendance of a registered medical practitioner was required as provided by Rule E. 21 (5), and the said child having died before a registered medical practitioner was in attendance, she neglected to notify the local supervising authority thereof, as required by Rule E. 22 (1) (b). The midwife neglecting to take and record the pulse and temperature of the patient at each visit, as required by Rule E. 14, and falsely and fraudulently recording in her temperature-book certain particulars purporting to represent the daily temperatures of the patient as taken by her, when in fact these records were entirely fictitious, no such daily temperatures having been taken by her or on her behalf.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee, held on June 12th, 21 cases were considered and £196 voted to 17 of the applicants. The following is a summary of certain of the cases relieved:—

Widow, aged 72, of L.F.P.S. Glasg. who practised at Rochdale and died in 1899. The little money left her by her husband now exhausted, and her only income is £1 per week from children, which has to keep her and a son, aged 51, who is a victim of the drug habit. She lives with a married daughter, who is in very poor circumstances. Voted £12 in 12 instalments.—Daughter, aged 57, of M.R.C.S. Eng. who practised at St. Day, Cornwall, and died in 1917. On the death of her father was left without means and her only income is now derived by acting as church organist and teaching music, which is very precarious. Pays £12 a year rent. Voted £12 in 12 instalments and referred to the Guild.—Widow, aged 33, of M.R.C.S. Eng., retired Captain, R.A.M.C., who practised at Caterham and died in March, 1917. Applicant's husband committed suicide, and her only income is the proceeds of an insurance policy. Has two children, ages 6½ and 4, and requires help towards their education. At present living with her father, who cannot afford to keep her. Voted £6 and referred to the Guild.—Widow, aged 39, of M.D. Glasg. who practised at Perth and died in 1916. On the death of her husband she endeavoured to sell the practice, but was not successful, as her husband had specialised in X ray work. Only income £56 a year from dividends. Has three children, ages 6–11. Lives in own house, but has to pay £16 a year for rates. Voted £10 in two instalments and referred to the Guild.—Widow, aged 33, of M.D. Dub. who practised at Redditch and died in March, 1917. Her husband was on civil military duty in North Wales and was awaiting a commission. He contracted acute pneumonia in the Army camp and died suddenly. Her only income is derived from investments on insurance money and produce about £60 per annum. There are two children, ages 1 and 4 years. Voted £10 and referred to the Guild.—F.R.C.S. Irel., aged 46, married, who practised in London. Applicant became infected with acute tuberculosis of the throat after examining a patient, and is now in a sanatorium. All his savings gone and unable to sell the practice, and only income a little allowed by his father-in-law. Voted £20.—Daughter, aged 44, of M.R.C.S. Eng. who practised at Notting Hill and died in 1885. Only income 5s a week allowed by sisters. Applicant quite incapable of earning her own living and her sisters unable to entirely provide for her. Her mother, who has recently died, was helped by the Fund for many years. Voted £5.—Daughter, aged 70, of M.R.C.S. Eng. who practised at Cranbrook and died in 1890. Applicant is quite incapable of working. Her income is only £46 per year, and she has to pay £1 per week for board and lodgings. Relieved 18 times, £182. Voted £12 in 12 instalments.—Daughter, aged 65, of M.R.C.S. Eng. who practised at Lydney and died in 1880. Lost the income left her by her father through a defaulting trustee. Too old to work. Only income £21 from another charity. Relieved 11 times, £116. Voted £12 in 12 instalments.—Daughter, aged 77, of M.R.C.S. Eng. who practised at Hackney and died in 1859. Applicant lost all her capital through a defaulting trustee. Has been operated upon several times for cataract. Only income £30 from another charity and £20 from friends. Pays £1 per week for board and lodgings. Relieved five times, £66. Voted £15 in 12 instalments.—Daughter, aged 65, of M.R.C.S. Eng. who practised at Liverpool and died in 1885. Applicant acted as matron at a mental nursing hospital for many years, but had to retire on account of rheumatism and deafness. Income from another charity and a dividend, £37. Relieved three times, £34. Voted £12 in 12 instalments.—Daughter, aged 53, of M.R.C.S. Eng. who practised at Box, Wilts, and died in 1894. In consequence of chronic ill-health unable to earn anything. Three sisters live together, only one of whom can work. One of the other sisters helped by the Fund. Relieved seven times, £96. Voted £12 in 12 instalments.—Widow, aged 62, of M.B. Dub. who practised in Acton and died in 1912. Applicant was left without means, but prior to the war her four children were able to help. Since the war, a son abroad, who used to pay her rent, has not always been able to help, and a daughter who lived with applicant broke her leg in February, and is still in hospital. Relieved four times, £25. Voted £10 in two instalments.—Widow, aged 52, of L.S.A. Lond. who practised at Leicester and died in 1910. Applicant was left without means, with four children, two of whom still go to school. The two eldest are now earning a little, but in consequence of applicant's ill-health and the high price of food cannot manage. Relieved five times, £60. Voted £12 in 12 instalments.—Daughter, aged 60, of M.R.C.S. Eng. who practised at Long Sutton and died in 1879. Applicant acts as housekeeper without salary, and her dividend is only £25 per year. Relieved twice, £24. Voted £12 in 12 instalments.—Widow, aged 70, of M.R.C.S. Eng. who practised in Jamaica and died in 1884. Applicant left without means. Has three children married with families, and unable to help. Income £26 from another charity, and a little help from friends. Pays 6s. per week rent. Relieved 12 times, £87. Voted £12 in 12 instalments.—Widow, aged 56, of M.R.C.S. Eng. who practised at Stockton-on-Tees and died in 1887. Applicant was left entirely without means, with two children to bring up. The son is now in the Army, and she gets 9s. 2d. per week Army allowance, and the daughter is a clerk, and allows her mother 14s. per week. Applicant has very bad sight. Relieved 13 times, £115. Voted £12 in 12 instalments.

THE King has appointed Mr. Edward Coker Adams a Member of the Executive Council and an Official Member of the Legislative Council of the Colony of the Gambia.

ORDER OF ST. JOHN OF JERUSALEM.—Mr. A. J. Johnston, M.R.C.S. Eng., L.R.C.P. Lond., has been promoted to Esquire in the Order of the Hospital of St. John of Jerusalem in England.

CENTENARIANS.—Mr. Thomas Weekes, of Ticehurst, has recently celebrated the 100th anniversary of his birthday, and Mr. C. Tearell, of Lympne, Kent, has died in his 102nd year.

INSANITY AND THE WAR.—In his report for the past year on Kingseat Asylum, Aberdeen, Dr. H. de M. Alexander notes that men belonging to the services who have become mentally affected through the war are accommodated in the war mental hospitals, so that it is fallacious to assume from any statistics that there is a decrease of insanity throughout the country meantime. The report goes on to say that "on the resident population here the war has had little effect. The majority are keenly interested in it and read the papers with avidity. They have taken the lighting restrictions philosophically and are not in the least perturbed by any scares. If detrimental effect has occurred at all, it pertains only to one or two egotistical paranoiacs into whose domineering speech has crept the curious braggadocio and phraseology characteristic of the Prussian."

DEATH OF WALTER JAMES HILL, L.R.C.P. LOND., M.R.C.S.—Mr. W. J. Hill, medical officer of health of Clevedon, Somerset, died recently at his residence in Clevedon from pneumonia, in his fifty-sixth year. The deceased was a student at the Bristol Medical School, and after holding several resident appointments at the Bristol Royal Infirmary, entered into partnership with the late Dr. S. Skinner, of Clevedon, and later succeeded to the practice. He held several public appointments and was medical officer of health of the town since 1902. He was also on the honorary medical staff of the Cottage Hospital, the local Dispensary, Walton Convalescent Home, and the Red Cross Hospital. Mr. Hill was surgeon-captain in the Gloucestershire Royal Garrison Artillery, T.F. He will be greatly missed in Clevedon, where he was highly respected, and much sympathy is felt there for his widow and daughter.

OXFORD OPHTHALMOLOGICAL CONGRESS, 1917.—This Congress will take place at Keble College, Oxford, on July 12th and 13th. On the evening of the 11th there will be an unofficial dinner in the hall of Keble College. On the morning of the 12th the Master of the Congress (Mr. Sydney Stephenson) will welcome the members in the Department of Human Anatomy, kindly lent for the purpose by Professor Arthur Thomson, and a discussion on "The Correction of Errors of Refraction" will be opened by Dr. George M. Gould, of Atlantic City, New Jersey, and Lieutenant-Colonel Robert H. Elliot. At 8.15 P.M. the official dinner of the Congress will take place, under the presidency of the Vice-Chancellor of the University of Oxford, the Very Reverend T. B. Strong, D.D., Dean of Christ Church; and at 9.15 P.M. there will be a general meeting to discuss the proposal of affiliation with the Ophthalmological Society of the United Kingdom. On the following day the programme is as follows:—Dr. Edridge-Green: "The Relation of the Theory of Vision to Ophthalmology."; Dr. George Young: "A Few Remarks on Clinical Tests of the Colour Threshold"; Lieutenant-Colonel R. H. Elliot: "On the Indian Operation of Couching"; Dr. D. V. Giri: "Ring Infiltration of the Cornea in a Case of Purpura"; Captain P. H. Adams: "Some Points on Retro-bulbar Neuritis." At 2.30 P.M. cases will be shown in the Eye Hospital, and at 3.30 there will be a discussion of the cases and remarks by Dr. Johnson Taylor and Captain R. J. Coulter. The scientific museum and exhibition will be open in the department of human anatomy on the two days. Members who purpose to be present should send the attendance fee (10s. 6d.) to the honorary secretary, Mr. Bernard Cridland, Salisbury House, Wolverhampton, without delay, and state whether they desire rooms reserved in Keble College.

Obituary.

ARTHUR WEBB JONES, M.D., B.S. LOND., F.R.C.S. ENG.,

SURGEON AND GYNÆCOLOGIST, GOVERNMENT HOSPITAL, ALEXANDRIA.

By the untimely death of Arthur Webb Jones the British community in Alexandria and numerous friends have sustained a great loss.

Dr. Webb Jones was educated at Malvern and St. Thomas's Hospital, and took the diploma of F.R.C.S. Eng. in 1900. He then worked for the degrees of the University of London whilst engaged in active practice in Egypt, and became B.S. in 1911 and M.D. in 1913. As the subject of his thesis for the latter degree he selected "Bilharziosis in Women," and on this difficult question he was able to write authoritatively, owing to his wide experience in gynæcological surgery in Alexandria. For five years, 1900–1904, Webb Jones served in the Egyptian Army in the Soudan; and on leaving that country in order to settle in private practice in Egypt he received the official thanks of the Governor-General of the Soudan for his services. His merits and abilities were recognised by his appointments as medical officer for the Alexandria district to the Egyptian State Railway and of surgeon and gynæcologist to the Government Hospital there.

During the Gallipoli campaign, when the medical and surgical resources of Egypt were taxed to the uttermost, Webb Jones volunteered and did yeoman service for the British troops from May, 1915, to December, 1916. With him it was a subject of much heart-searching that he was not in khaki, but it was on the assurance of the military authorities that he was doing excellent work and could not give better help that he refrained from applying for a commission. There is no doubt that his strenuous labours indirectly shortened his life, which was closed by one of those tragedies only too familiar to medical men. He had not been out of Egypt since 1913, and when an epidemic of typhus fever broke out this spring in Alexandria, it found him fatigued and somewhat out of health, though keen as ever upon his duties. He was called upon to give an intravenous injection of saline solution to a brother practitioner, dying from typhus, and accidentally inoculated himself in doing so. In about 10 days the disease showed itself, and despite the assiduous and affectionate care of Colonel Sandwith, consulting physician, E.E.F., of Captain Charles Walker, R.A.M.C., and other friends, he succumbed to the infection. His funeral was attended by representatives of every official and administrative branch with which he was or had been connected, and by many private friends.

Of his abilities as a surgeon Colonel A. H. Tubby, A.M.S., consulting surgeon to the Mediterranean Expeditionary Force, who had recent opportunities of forming an opinion, writes as follows: "Webb Jones was a sound diagnostician, and a resourceful and skilful operator. His judgment was good and his successes numerous. Looking through his notebooks we find his cases carefully recorded; and he was in the habit of adding his subsequent impressions and investigations to the account of each case, thus continually crystallising his experiences and perfecting his knowledge and technique. As a colleague he was all that one could desire, and happy were those who were admitted to his friendship. A winning manner, entirely free from any trace of self-assertion, a broad outlook on life, and an obvious sense of complete responsibility, combined to render him a tower of strength in trouble and illness. Had he been permitted to reach the allotted span of life he would have gone far. He leaves a widow and a young family and numerous friends to grieve at his departure."

THE death occurred on June 20th of Thomas Sheldon, M.D. Edin., M.R.C.S. Eng. He was in his 83rd year, and had been in practice in Kensington for 54 years. He qualified as M.R.C.S. Eng. in 1859, and M.D. Edin. in 1863. He was educated at University College Hospital, London, and at the University of Edinburgh. He had been resident physician at the Royal Infirmary, Edinburgh, under Dr. James Warburton Begbie, and later medical officer of the Kensington and Notting Hill Division of the Post Office. A justice of the peace for the County of London, he was the eldest son of William Sheldon, J.P., of Stratford-on-Avon. Two of his sons are in the medical profession, the eldest at present a lieutenant in the Royal Army Medical Corps, and the other a fleet-surgeon in the Royal Navy.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Report of the Mesopotamia Commission.

THE report of the Commission to inquire into the Operations of the War in Mesopotamia was presented to Parliament on Tuesday last, and in many directions disclosed lamentable ignorance and laziness as well as ill-founded optimism on the part of the military and civil authorities who were responsible for the planning of the campaign. The breakdown in medical arrangements was not made the subject of a separate report, as had been expected, but forms the whole of a separate section of the general report. In this part of the report the Commission criticises the work of Surgeon-General BABTIE, who was Director of Medical Services in India up to June, 1915, although admitting that his experience in his post when the war broke out had been very short, and that he had to work in an atmosphere unfavourable to reform. But no excuse is made by the Commission for the action of Surgeon-General HATHAWAY, who, as Principal Medical Officer in Mesopotamia, officially reported "Wounded satisfactorily disposed of," and throughout the campaign suppressed the unpleasant. The Government will be pressed to give a day for a discussion of the report.

Military Service (Review of Exceptions) Act.

In the course of debate in the House of Commons on Thursday, June 21st, Mr. MACPHERSON, the Under Secretary for War, announced that the Government is willing to appoint a small Parliamentary Committee to examine into the working of the Military Service (Review of Exceptions) Act. The administration of the statute and the system of medical re-examinations which have taken place under it have given rise to considerable criticism in the House of Commons, and the subject was reviewed by speakers in all quarters. The discussion took place in Committee of Supply on Army Estimates.

Mr. PRINGLE introduced the subject by moving a reduction of £100 in the salary of the Secretary of State for War. His object, he said, was to call attention to what he thought might be described as the scandals in connexion with the medical re-examination of discharged and rejected men under the Military Service (Review of Exceptions) Act. When that Act was passed some months ago assurances were given that if the re-examination were carried out, it would be carried out with exceptional care and kindness. But the recruiting authorities had shown absolutely no discretion and discrimination in the way in which they had called men up. In nearly every area in the country they had sent out notices for re-examination not only to men who had obtained fraudulent exemption or had been carelessly examined or who, they had reason to believe, had improved in health, but they had called upon the halt, the lame, the blind, the mute, the mad, and even the dead to appear before the examining boards. When men were actually admitted to re-examination they were, as a rule, treated with the utmost harshness. If they presented any evidence at all regarding their medical condition—and they were entitled to do that for the guidance of the medical board, and, indeed, in the House of Commons they had been invited to do that—the certificates were systematically ignored and often torn up in their faces. The examination itself was often of the most perfunctory character. It was true that there were usually three medical officers present, but in the great majority of cases the decision rested with the military officer who was chairman of the board. Having dealt with certain individual cases the honourable Member said that there was complete evidence that many thousands of men were being taken into the Army to-day, and had been taken in during recent months, who were unfit for any form of service.

Sir GODFREY BARING said that as chairman of an appeal tribunal his confidence in medical boards had been rudely shaken. Many of the chairmen of district medical boards were members of the Royal Army Medical Corps. He did not wish to say anything against their honour or integrity, but it must be evident that men who were dependent on the War Office for their professional advancement must wish to do what they believed the War Office required. He believed that these men thought that what the War Office required was quantity, not quality. He should like to see a larger number of civilian medical men made chairmen of medical boards, men who were wholly independent of the War Office.

Reply for the War Office.

Mr. MACPHERSON (Under Secretary for War) in his reply insisted that the War Office was acting in good faith. It was hoped by the re-examinations under the Act to get 60,000 "A" men and 60,000 for the other categories, in all 120,000 men. But it had been expected that 920,000 or 950,000 might be called upon for medical examination, and thus these called up for re-examination would in very many cases not see service. Men were now required for the Army whose work could be very well performed by women. The Army to-day was quite a different organisation from the Army of three years ago. Labour in the Army, for instance, had become quite a different problem, and a gigantic problem. Men were required at the front now to look after and drive trains and lorries, to look after horses, to make roads, to check and issue stores, to sterilise clothes, to look after washhouses and baths, to repair harness, boots, and clothes, and to mend rifles. In fact, any man sufficiently well to earn a livelihood in his civil capacity could be of use in the Army. It required one-and-a-half men behind the lines to keep one man in the trenches. That fact was forgotten in many of the speeches that had been made. The representation was made that all men who were suffering from wounds or poisonous gas or neurasthenia were called up for service. But the

Statutory Order, which was sent to every man who might be liable for re-examination, stated that the notice did not apply to men discharged in consequence of disablement, if it had been certified under the authority of the Army Council or the Admiralty to be the result of wounds (including injury from poisonous gas) received in battle or in any engagement with the enemy or otherwise from the enemy, or in consequence of neurasthenia or allied functional nerve disease, if so certified by a special medical board to be the result of naval or military service in the present war. All that the man had to do was to fill in the form at the back and send it to the recruiting officer, and probably then he would hear no more about it. The only further thing he wished to mention was that he agreed that this re-examination experience might have inflicted hardship. The Government had recognised that, and it was now prepared to say that all men who had served abroad and had been discharged from the Army, and were now coming compulsorily under this Act, if they made a claim at once would be finally discharged. That was to say, every soldier who was disabled by wounds or discharged from sickness or ill-health abroad would be excepted under this Act.

Mr. HOGGE: Is that a concession?

Mr. MACPHERSON: Yes.

Mr. HOGGE: When?

Mr. MACPHERSON: I do not know when it will apply, but it will apply to all those mentioned by me. It had been stated frequently that the War Office issued secret instructions to medical officers, and that on the strength of these instructions men were being forced into the Army. He had denied in the House that any such secret instructions were issued. He denied it again, and he would ask his honourable friend (Mr. Hogge) if he could produce them.

Mr. HOGGE: I have seen them.

Mr. MACPHERSON: Will the honourable Member produce them?

Mr. HOGGE: If the position of the men is not prejudiced. Will you give a pledge of complete immunity?

Mr. MACPHERSON: Certainly. I asked the honourable Member if he would produce these instructions.

Mr. HOGGE: And I said I could do it.

Mr. MACPHERSON: If those instructions were issued—and they were not—they were issued to professional gentlemen. That was the allegation. He did not think any member of a high profession such as the medical profession would receive instructions from anybody without something in writing. Did honourable Members think that Sir Frederick Treves of the Central Medical Board or other men of high professional standing would receive instructions? They would tear up in righteous indignation any secret instructions that might be given by the War Office.

Army Council's Instruction.

As a matter of fact one instruction only was issued and it was contained in the Army Council orders. He gave a pledge that every consideration should be given to every man called up for re examination. The honourable gentleman then quoted at length this instruction. It stated that the Army Council directed that the greatest care and consideration in medical re-examination should be shown for disabled men. Many of them had served overseas, and of those who had so served only men who on re-examination were found fit for category A or for category B (1), B (2), or C (1) were to be called for service. The remainder, men although categorised C (2), B (3), or C (3), were to be allowed to return home. Disabled men who had not served overseas were in a slightly different position. They also deserved in the majority of cases consideration. There were, however, amongst them certain persistent malingerers, and also a certain number who in the earlier days of the war were improperly discharged on inadequate grounds. Even so it was essential that these men should be examined considerately. With regard to the posting of such discharged men as were taken for service and were lower than category A, the policy of the Army Council was that these men should be exposed to the least possible risk of further wounding or disease. In all cases it must be remembered that these men had already served, that many of them had faced trying experiences, and it was not to be expected that on the average their nerve would be as sound as it had been. This Army Council instruction was sent to all medical officers. Men were being examined at the rate of 15,000 a day, and there was a very much depleted staff of medical men to deal with these enormous numbers. If the medical board was in a rural district the president of the board asked the local medical men to assist him, and the board was invariably composed of no fewer than the president and two medical men, but the average board consisted of the president and four members, and at least three medical men passed each case through their hands. If it happened to be an important centre and not a rural area, the local medical board executive committee found the personnel of the board and formed a panel, and he understood that in that case, too, the medical board invariably consisted of the president and two members, and sometimes the president and four members.

Sir R. ADKINS: Can the president's decision override that of his two or four colleagues?

Mr. MACPHERSON: I cannot say definitely at the moment. He went on to point out that for men who had got leave to go before a special medical board, three such boards had been established. In addition, the War Office had recently appointed inspecting officers. The War Office had the advantage of having at headquarters the distinguished services of Colonel James Galloway, who was senior physician to Charing Cross Hospital, and there were the travelling inspectors under General Burney, six of whom had visited every medical board in the country. The inspectors were visiting the main recruiting areas and the areas from which complaints had come. It was quite easy to come to the floor of the House and to make out a case by citing individual cases and investigated cases, but upon the general policy of the War Office he made bold to say that wherever an instance of injustice was brought to its notice individually it had been investigated. In reference to what he had said as to the system of inspection by those medical boards which had been instituted, the inspectors were doing their level best to make the work of those boards as satisfactory and as fair as possible to the unfortunate men who in this great national crisis had to be called upon again to be examined in case they might be of some further service. The Government, he was authorised to say, was quite willing and quite ready to appoint a small Parliamentary Committee to do what the Government had already done—to examine into the working of this Act. The War Office was prepared to meet any criticism or any attack that might be made.

Mr. Asquith's Criticisms.

Mr. ASQUITH said that the decision to appoint a Parliamentary Committee had relieved him of a considerable burden. No one could have listened to the two speeches with which this discussion was introduced, and no Member of the House could recall the contents of his letter-bag during the course of the last six weeks without feeling whether or not the 120,000 men had been obtained that they had been got by means which had excited widespread displeasure and indignation. He was not making any charge against the authorities or the War Office, and he was glad that the circular which the Army Council issued was going to be made public. It seemed to him to have been well conceived and well expressed. Instructions, and, indeed, the best paper safeguards which could be invented, would not, in circumstances such as these, prevent the occurrence of gross local and personal cases of hardship. The right honourable gentleman went on to say that he had letters which came to him from every part of the country which convinced him, looking at this thing quite impartially, that everywhere there were men whom no reasonable body of medical or other experts ought ever to have dreamt of passing, he would not say for general service but for any form of military service whatsoever. They frequently complained—he was afraid because these medical boards were very congested with the business—that they, after what had been a very brief and perfunctory examination, and in defiance of the opinion of the medical practitioners who knew the history of the individual concerned, had been passed in an almost reckless fashion into one or other of these categories. He was sorry to say that the evidence on that point was absolutely overwhelming. There was no honourable Member in any quarter of the House hardly who had not received evidence of that fact and that the right of appeal available was very insufficient protection. The right honourable gentleman then dealt with the 490 appeals to the County of London Tribunal in the course of nine months. Of these appeals, in 28½ per cent. of the cases there was no alteration; in little more than 10 per cent. the category in which the man was placed was raised, and in 60 per cent. the category was lowered, and in nearly 20 per cent. of that 60 per cent. not only was the category lowered but the man was referred back or rejected altogether. That showed that in this tribunal in considerably more than half the cases the opinion of the medical board was reversed. If that had been the case in the County of London, honourable members might be sure that it had been the case in other parts of the country also. He did not want in any way to forestall the conclusions of the committee which he was glad was going to be appointed, but he would venture to make one or two suggestions. He thought that the constitution of the medical tribunals of first instance ought to be modified and improved. If it was a fact, as had been stated, that the president had the power—he did not know whether it was so or not—

Mr. BONAR LAW (the Chancellor of the Exchequer): It is not so.

Mr. ASQUITH: My right honourable friend says it is not so, and I am sure it is not intended to be within the competence of the president to overrule the opinion of his colleagues. But has it been the practice that the president of these tribunals had overriden the opinions of his colleagues? If it had, that seemed to indicate a line of reform which he would suggest first and foremost, that it should be clearly understood that there was complete parity of authority between the different members of the medical board, and next, that as far as possible the president of the board should be a person who was not himself in the employment of the War Office. Another suggestion which he should like to make was in regard to men who had been at the front, men who had been wounded and invalided, that when they had been recalled and it had been decided that they were not fit to return the decision should be taken as final.

Mr. BONAR LAW: I think that is the case now.

Mr. ASQUITH: Not from the information which reaches me. What he had said had not been animated by any unduly critical spirit.

Honest Attempt to Administer the Act.

Mr. BONAR LAW said that he asked the House to believe that there had been an honest attempt on the part of the War Office to carry out what was the deliberate intention of the Government and the House when the Act was passed. The right honourable gentleman had made a suggestion about the composition of medical boards. It was quite obvious that the appeals could only in any case be a very limited number. He wanted the House to understand what the Government did in this matter. Before the Bill was passed they knew that there would be the need for a far larger force of medical examiners than before. They took all the steps in their power to get competent men. In December last year Colonel Galloway, who was a leading physician at Charing Cross Hospital and an examiner in London University, was appointed by the Government as inspector of these medical boards. He had seen him, and Colonel Galloway had told him that he himself had examined and visited almost every one of them. The House would not think it out of place if he read Colonel Galloway's account of these boards. This was what he said: "There must be errors made from time to time among the large number of decisions arrived at by these medical boards. There must be cases in which differences of temperament of the men under examination and of the medical examiners give rise to friction and cause for complaint. But on occasions too numerous to mention I have been a witness to the patience and courtesy shown by members of the medical boards in cases where these qualities have been subjected to severe trial." Colonel Galloway went on to say that in his opinion these medical boards, the members of which were almost entirely civilian though holding temporary Army commissions and who had their private practices to fall back upon, were rendering great service to the country, and that one of the results of this kind of criticism was that they had the feeling that neither the Government nor the House of Commons was supporting them in their work, and that they were not getting credit for the great services which they were rendering to the country. He (Mr. Bonar Law) was not disposed in the smallest degree to come here on behalf of the Government in a spirit of apology. He was satisfied that at no time had any of the work of the War Office been done so conscientiously, and he doubted whether it had been done more effectively

In the course of the subsequent discussion Mr. NIELD expressed the view that the whole subject of medical re-examinations needed to be inquired into and drastically overhauled. Sir W. COLLINS emphasised the desirability of giving greater opportunities of access to the special

medical boards. Sir R. ADKINS criticised the medical re-examinations. Mr. HOGGE urged that the Committee of Inquiry should be speedily set to work.

The motion for the reduction of the vote was ultimately withdrawn by Mr. Pringle on the ground that a committee was to be appointed.

Committee Appointed.

On Tuesday, June 26th, a Select Committee of the House of Commons was appointed to inquire into and report upon the instructions issued by the War Office with regard to the administration of the Military Service (Review of Exceptions) Act and on the method, conduct, and general administration of medical examinations under the Military Service Acts. The Committee consists of Sir G. BARING, Mr. MONTAGUE BARLOW, Mr. COCHRANE, Colonel FABER, Colonel GRETTON, Mr. H. LAW, Mr. NIELD, Mr. PRINGLE, Mr. CARADOC REES, Mr. SHORTT, and Mr. SUTTON.

HOUSE OF COMMONS.

THURSDAY, JUNE 21ST.

Casualties amongst Medical Officers.

Mr. MACCALLUM SCOTT asked the Under Secretary for War how many medical officers had been killed and wounded respectively since the commencement of the war.—Mr. MACPHERSON answered: The numbers of Regular (including temporary commissioned) and Territorial officers have been as follows:—

Killed in action	137
Died of wounds	58
Died of disease	62
Wounded	707
Total	964

Figures for Colonial officers are not readily available.

Medical Students in England and Scotland.

Mr. MACCALLUM SCOTT asked the Parliamentary Secretary to the Board of Education what were the most recent figures of the number of medical students, men and women respectively, in England and Wales, as compared with the number in the year before the war.—Mr. LEWIS replied: The numbers of medical students in medical schools receiving grants from the Board of Education in 1913-14 and 1916-17 are 3483 and 1981 respectively. The returns made to the Board do not distinguish between men and women students. The figures do not include the medical schools at Oxford University, Guy's and Middlesex Hospitals, Bristol University, or the University Colleges of Nottingham, Reading, Southampton, and Cardiff, with regard to which the Board is unable to supply similar information.

Replying to Mr. MACCALLUM SCOTT, Mr. MUNRO (Secretary for Scotland) stated that he was informed that the figures of medical students attending Scottish Universities were approximately as follows: In the year before the war, 2367 men and 236 women; in the present year, 1510 men and 696 women.

Superannuation of Officers under the Mental Deficiency Act.

Replying to Mr. YEO, Mr. BRACE (Under Secretary at the Home Department) said that an order would be issued in due course applying the provisions of the Asylum Officers' Superannuation Act to the officers of certified institutions provided by local authorities under the Mental Deficiency Act. Some difficulties had, however, arisen. In particular, there was no power as the Acts stood at present to aggregate service in these institutions with service in asylums. These difficulties could only be removed by fresh legislation. The matter was not being lost sight of, but it would be impossible, he was afraid, to take it up this session.

Acting Promotion of R.A.M.C. Officers.

Captain WRIGHT asked the Under Secretary for War why appropriate acting rank was given to officers of the Royal Army Medical Corps recently sent overseas with special Territorial general hospitals, who were by special arrangement to serve for a minimum period of three months and to be relieved when necessary, when similar appropriate acting rank had been refused to officers of the same corps occupying similar positions in Territorial hospitals in France who had been serving in His Majesty's forces before the war and continuously since mobilisation, and in some cases for over two years at the front, and who were subject to no such special arrangements as to minimum period of service or relief.—Mr. MACPHERSON wrote, in reply: When a general hospital is mobilised at home appropriate rank is given to the superior officers of the unit, but it has been decided that acting promotions need not be given in the case of vacancies occurring in units serving abroad. As stated in my reply last week, the question of acting promotions in such cases is under consideration.

MONDAY, JUNE 25TH.

Protection of Troops from Venereal Disease.

Sir G. GREENWOOD asked the Chancellor of the Exchequer whether the Home Office and the War Office had now come to an agreement as to the administrative action to be taken in order to protect the oversea troops from venereal disease; and whether he could state what form such action would take.—Mr. BONAR LAW replied: The military and police authorities are already using such powers as they possess to deal with the evil referred to in the question, and it appears doubtful whether more can be done without legislation, but the matter is receiving constant consideration.

TUESDAY, JUNE 26TH.

Lunatic Soldiers.

In answer to Sir G. TOULMIN, Mr. BARNES (Minister of Pensions) said: The cost of maintenance of a discharged soldier under detention in an asylum is chargeable against his pension under the Lunacy Act, 1890, and the Royal Warrant of December, 1914. I have now arranged that a discharged disabled man shall, while in an asylum, be treated on the footing of a private patient, his maintenance being paid for by the State. An extra payment of 3*s.* 9*d.* a week is made to the asylum authorities to enable them to provide suitable private clothing and other amenities for the man, and 2*s.* 6*d.* is given to the man himself for personal comforts. Under Article 6 of the New Warrant and Order in Council special provision is made for the maintenance of the family and dependants of a man in an asylum whose disability is due to war service. The right honourable gentleman also said (in answer to Mr. ELLIS GRIFFITH): If the lunacy is attributable to, or aggravated by, service, the man's wife will, from the date following the man's discharge from the service, receive the same allowance as would be granted to her if she had been left a widow, together with allowances for any children. His dependants will be similarly provided for. If the lunacy is not so attributable or aggravated, the gratuity, in most cases a substantial one, which would have been awarded to the man will be administered by the Ministry in the interests of the man's family under the Lunacy Act of 1890.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

BREW, E. V., has been appointed Medical Officer of Health for the Clutton (Somerset) Rural District.

ELDER, W., M.B., Ch.B. Glasg., Certifying Surgeon under the Factory and Workshop Acts for the Annan District of the County of Dumfries.

HARCOURT, M. A., M.B., Ch.B. Edin., Temporary Medical Officer and School Medical Officer for the County of Holland (Lincolnshire).

RICHMOND, JAMES ROBERT MARR, L.S.A., L.M.S.S.A. Lond., Acting Medical Officer of Health for the St. Just (Cornwall) Urban District.

STAPLE, JAMES D., M.R.C.S. Eng., Temporary Honorary Medical Officer to the Lyme Regis Cottage Hospital.

WHITWORTH, WILLIAM CUTHBERT, L.R.C.P., M.R.C.S., Temporary Medical Officer for the St. Agnes and Perran Districts by the Truro (Cornwall) Board of Guardians.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

ABERDEEN ROYAL ASYLUM.—Temporary Assistant Physician. Salary from £250 to £350 per annum, with board, &c.

BELGRAVE HOSPITAL FOR CHILDREN, Clapham-road, S.W.—Resident Medical Officer for six months. Salary at rate of £75 per annum, with board, &c.

BIRMINGHAM.—Female Locum Tenens for Infant Consultation Work for three months. Salary 8 guineas per week.

BOURNEMOUTH, ROYAL VICTORIA AND WEST HANTS HOSPITAL, Boscombe Branch.—Resident Medical Officer. Salary £300 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURTON-ON-TRENT INFIRMARY.—Resident House Surgeon. Salary £250 per annum, with board, &c.

COVENTRY AND WARWICKSHIRE HOSPITAL.—Resident House Physician. Salary £250 per annum, with board, &c.

DARLINGTON GENERAL HOSPITAL.—House Surgeon. Salary £200 per annum, with board, &c.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

FARNWORTH, BOLTON, TOWNLEYS MILITARY HOSPITAL.—Female Assistant Medical Officer. Salary £383 5*s.* per annum, with rations, &c.

FOLKESTONE, ROYAL VICTORIA HOSPITAL.—Resident Medical Officer. Salary £200 per annum, with board, &c.

GLOUCESTERSHIRE ROYAL INFIRMARY AND EYE INSTITUTION.—Assistant House Surgeon. Salary £150 per annum, with board, &c.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill.—Resident House Physician for six months. Salary at rate of £200 per annum.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

LEICESTERSHIRE EDUCATION COMMITTEE.—Temporary Assistant School Medical Officers. Salary at rate of £360 per annum.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, near Manchester.—Two Female Resident Medical Officers, unmarried. Salary at rate of £200 per annum.

MANCHESTER UNION, NELL LANE MILITARY HOSPITAL, West Didsbury.—Locum Assistant Resident Medical Officer. Salary £7 7s. per week, with board, &c.

MELTON, SUFFOLK, ST. AUDRY'S HOSPITAL FOR MENTAL DISEASES FOR THE COUNTY OF SUFFOLK.—Second Assistant Medical Officer. Salary £250 per annum, with board, &c.; if married, £350 per annum, with board for self only.

NOTTINGHAM GENERAL HOSPITAL.—Holiday Locum Tenens, Female. Salary at rate of £250 per annum, with board, &c.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL.—House Physician. Salary £200 per annum, with board, &c.

PORTSMOUTH PARISH WORKHOUSE INFIRMARY, WORKHOUSE, AND CHILDREN'S HOME.—First Assistant Medical Officer. Salary £250 per annum, with rations, &c.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—Assistant Resident Medical Officer for four months. Salary at rate of £60 per annum, with board, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Examiner in Dental Surgery. Also Election to the Court of Examiners.

ROYAL LONDON OPHTHALMIC HOSPITAL, City-road, E.C.—Third House Surgeon. Salary at rate of £50 per annum, with board, &c.

SALFORD UNION INFIRMARY, Hope, Pendleton, near Manchester.—Female Assistant Resident Medical Officer. Salary £250 per annum, with rations, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SOUTH LONDON HOSPITAL FOR WOMEN, South Side, Clapham Common, S.W.—Female House Physician and House Surgeon for six months. Salary at rate of £100 per annum each, with board, &c.

STOKE-ON-TRENT COUNTY BOROUGH.—Female Assistant Medical Officer, in connexion with Maternity and Child Welfare Work, &c. Salary £350 per annum.

SUNDERLAND COUNTY BOROUGH.—Temporary Tuberculosis Medical Officer. Salary at rate of £500 per annum.

WOKINGHAM, BERKS, PINEWOOD SANATORIUM FOR TUBERCULOSIS.—Medical Superintendent. Salary £500 per annum, with board, &c.

WOLVERHAMPTON AND MIDLAND COUNTIES EYE INFIRMARY.—House Surgeon. Salary £150 per annum, with board, &c.

YORK, CITY OF.—Temporary Tuberculosis Officer. Salary at rate of £500 per annum.

Births, Marriages, and Deaths.

BIRTHS.

BRENAN.—On June 19th, at Carlton-road, Sidcup, the wife of Captain A. R. M. Brenan, R.A.M.C., of a son.

FALWASSER.—On June 23rd, at Warwick House, Maidstone, the wife of Lieutenant-Colonel A. T. Falwasser, R.A.M.C.T., of a daughter.

HAMILTON.—On June 17th, at Holmesdale-road, Sevenoaks, and of Lifford House, Dartford, the wife of Major Hamilton, R.A.M.C.T., of a daughter.

KILLICK.—On June 21st, at Trinity House, Maidstone, the wife of Captain C. Killick, R.A.M.C., of a son.

PALMER.—On June 20th, at Nottingham-place, W., the wife of Captain A. C. Palmer, R.A.M.C., F.R.C.S., of a son.

WOOLLARD.—On June 22nd, at Osnaburgh-terrace, N.W., the wife of Herbert Henry Woollard, M.D., Major, A.A.M.C., of a son.

MARRIAGES.

BATE–TROUBRIDGE.—On June 21st, at Christ Church, Chelsea, John Brabant Bate, Captain, R.A.M.C.T., and West African Medical Staff, to Helen Cecil Margaret, youngest daughter of the late Colonel Sir Thomas Troubridge, Bart., C.B.

ELLIS—FRASER.—On June 18th, at St. Mary Abbots Church, Kensington, Captain G. W. Ellis, R.A.M.C.(T.), to Mary Taylor, only daughter of Mr. John Fraser.

MONTGOMERY–MCELROY.—On June 20th, at St. Charles's, Ogle-street, W., by the Rev. Ernest D. Hanifin, Samuel Alexander Montgomery, Captain, R.A.M.C., to Nellie Teresa, daughter of the late Mr. Bernard McElroy, Leigherntain, Killala, co. Mayo.

RUDKIN—WINCH.—On June 23rd, at Holy Trinity Church, Northwood, Captain G. W. R. Rudkin, R.A.M.C., to Alice Edith, eldest daughter of R. F. Winch, M.A. Cantab., and Mrs. Winch, of St. Valery, Northwood.

DEATHS.

BALLANTYNE.—On June 26th, at Holker House, Darwen, James Todd Ballantyne, Physician and Surgeon, the much-loved husband of Susannah Ballantyne, in his 73rd year. Funeral, Saturday, June 30th. Service, Belgrave Chapel, Darwen, 10.30 A.M.

BELL.—On June 19th, at Rathwell, Manitoba, Canada, Robert Bell, M.D., LL.D., D.Sc. Camb., F.R.S., and late of the Geological Survey of Canada, Ottawa.

MILWARD.—On June 18th, at Stanton-road, Wimbledon, James Milward, M.D., M.R.C.S. Eng., L.S.A.

SHELDON.—On June 20th, at Powis-square, W., Thomas Sheldon, M.D., J.P., aged 82.

WRIGHTSON.—On June 20th, at Clare House, Aldeburgh, Suffolk, Richard Blayney Wrightson, M.D.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

ANTHRAX SPREAD BY SHAVING BRUSHES.

IN the later months of 1915, and again at intervals in the course of the succeeding year, outbreaks of anthrax occurred in this country which were suspected to be due to infection conveyed by shaving brushes. In THE LANCET of Jan. 1st, 1916, we published a paper by Dr. Reginald R. Elworthy, who had treated several cases at the West London Hospital. These were the first cases hitherto recorded in which malignant pustule or external anthrax had been caused by this means, and subsequent inquiry revealed the fact that other shaving brushes had been discovered which were grossly contaminated with these bacilli. Dr. Elworthy's investigations proved that infection in the first case was due to the use of a recently purchased shaving brush. The presence of virulent anthrax spores was demonstrated in this brush, and also in several unused brushes of similar pattern, purchased at the shop which supplied the original brush. Another case of anthrax occurring about the same time, which was traceable to the same cause, a further investigation was made which established the common origin of all the cases in a single factory. The matter coming to the notice of the Local Government Board a further investigation of the facts has been made by Dr. Francis J. H. Coutts, whose report[1] has recently been issued by the Board's principal medical officer. In addition to the above cases, in which brushes manufactured in England were implicated, there were, it appears, four further cases of anthrax traceable to brushes of foreign manufacture, two of which occurred in soldiers. The brushes in this case had been made either in Canada, America, or Japan. The full details of Dr. Coutts's report show that, although the danger of anthrax from infected shaving brushes may be limited in extent, it nevertheless constitutes an appreciable risk which ought to be removed. The Board are considering what administrative action, by way of guarantee or otherwise, is required to secure that all brushes used for this purpose shall be free from infection.

THE MESSAGE OF THE ARTISTS.

MANY of the leading British artists have combined to show in a series of lithographic prints the aims of Britain and her Allies in the war, and also some typical and impressive aspects of the British effort against the enemy. The British aims are shown in a series of allegories printed in colour. "The Freedom of the Seas" is rendered by Mr. Frank Brangwyn, "The Restoration of Belgium" by Mr. George Clausen. Other subjects are undertaken by Mr. Dulac, Mr. M. Greiffenhagen, Mr. Augustus John, Mr. Ernest Jackson, Mr. Gerald Moira, Mr. William Nicholson, Mr. Charles Ricketts, Mr. W. Rothenstein, Mr. Charles Shannon, and Mr. Edmund J. Sullivan. The British effort is typified in several series, such as "Making Soldiers," by Mr. Eric Kennington; "Making Ships," by Mr. Muirhead Bone; and other series by Mr. Frank Brangwyn, Mr. Clausen, Mr. Nevinson, Mr. Hartrick, Mr. Charles Pears, Mr. W. Rothenstein, and Mr. Claude Shepperson. The works will be exhibited in the first instance in the Galleries of the Fine Art Society, New Bond-street, London, for a period dating from July 6th, and afterwards in galleries throughout the country. Arrangements will also be made for their display in Allied and neutral countries.

A SURVIVAL OF ARCHAIC THERAPEUTICS.

To the Editor of THE LANCET.

SIR,—One is not easily surprised nowadays, but I have been surprised recently by a survival of archaic therapeutics which has come to my notice. The patient was a coachman in a good position. Lately he had been acting as gardener and, when using a heavy curved hedger's knife, inflicted a sharp cut on the left wrist at the base of the thumb, baring, but not dividing, two of the extensor tendons. He came to me about eight hours afterwards. On removing a dry dressing a wound about 1½ inches long cleanly united was revealed, evidently closed by "primary union." There was a peculiar yellowish powdery efflorescence about its edges, and I asked what he had applied. "Oh, a very old-fashioned remedy. I just made water over it once or twice while it was still open." Questioned further, he said that this recipe for using fresh urine had been in his family for many years and had come originally from an old "soldier man" of great experience.

[1] Reports on Public Health and Medical Subjects, No. 112, pp. 20, price 6d.

Asked if many still used the method he said, "Oh, there's a goodish few does—them as knows it." It was for fresh wounds only that he recommended urine, not to be applied as a dressing, but solely by natural irrigation. He does not approve of its use as a collyrium for the eyes; and I remember years ago a disgusting old man in the workhouse, bleary with chronic conjunctivitis, whose long-suffering fellows at last complained of his society by reason of his offensive odour. He was ammoniacal—very, and as he apparently contrived to saturate his clothing upwards, right up to the chin, he was followed in one of his frequent visits to the lavatory, and there was seen laboriously to douche both eyes, using the cupped palm of either hand alternately as an eye-bath, after which he returned to the sitting-room. Here the result was not good; in fact, changing the prescription at once produced improvement; but in the case of the cut wrist I am bound to say that I have never seen a fairly severe cut unite more satisfactorily; there was complete absence of inflammation and the union was permanent.

I am, Sir, yours faithfully,

Bromsgrove, June 15th, 1917. H. CAMERON KIDD.

PS.—Since the above was written the patient further informs me that his prescription is well known as an infallible remedy in veterinary work for recent wounds in horses.

CHEESE-MAKING IN CORNWALL.

THE Cornwall County Cheese School has had a successful four weeks' course of demonstration at Egloskerry. The chairman, at the close of the session, said that cheese-making could be made profitable, as from 393 gallons of milk the students had made 393 lb. of cheese.

MOHAIR AND ANTHRAX.

THE Director of Army Contracts is now undertaking a census of stocks of wool and wool products and of fabrics containing wool suitable for clothing. There is a medical side in this, and especially is mohair a subject of medical interest. The scarcity of mohair makes itself known to the ordinary man nowadays when he demands a pair of mohair boot-laces, but the medical man thinks of mohair chiefly from its connexion with the history of anthrax, first noted in the Bradford district after the introduction of alpaca and mohair as textile materials in 1837. The amount then used was small, but 30 years later, in 1867, the amount of mohair imported into the United Kingdom from Turkey was 2,421,188 lb., valued at £312,986, and from British South Africa only 43,348 lb., valued at £4985. Thirty years later, in 1897, we imported from Turkey 10,701,390 lb., valued at £742,203, and an enormously increased amount from South Africa of 12,055,390 lb., valued at £634,419. Just before the war, although the amount imported from Turkey was about the same as in 1897, the import from British South Africa had risen to over 24,000,000 lb., valued at over a million sterling. The number of Angora goats in South Africa, ascertained at the census taken in 1911, was 4,275,335, over 3,000,000 of them being in Cape Province. The possession of this number of goats explains the large increase in production of mohair. In 1867 the average price of mohair was 31*d.* per lb.; in 1897, 14½*d.* per lb.; and just before the war had descended to 11*d.* per lb., although the Turkish was 14*d.* per lb. Bradford is the centre of the mohair-spinning trade of the world, so that its influence over the spread of anthrax is mainly felt in this country. Where cases of anthrax have been traced to mohair it is to the Turkish product in the majority of instances. The average production of mohair per annum from each Angora goat is about 2½ lb. In South Africa there is a summer and winter clip, giving long and short hair. The South Africans have taken immense trouble and expense in introducing high-class rams and ewes from Persia, Cashmere, and different parts of Europe, but notwithstanding the quality of the mohair varies in different localities. Bradford, actively concerned in preventing anthrax in its workers and products, has instituted many inquiries into the pathology and spread of the disease. Several sera have been invented for the treatment of the disease, the latest of which was referred to in THE LANCET of May 12th, 1917. Much progress has been made in therapeutics recently, but further study is sure to be repaid. But the war having reduced the supply of mohair from Turkey must have had an influence on the cases of anthrax as well as on textile trade and the personal requirements of the public. The stoppage of imports of many of the articles to which we had become accustomed has undoubtedly often a medical side not always immediately perceivable, and there is a fortunate side to a scarcity of hides and hair.

The following journals, magazines, &c. have been received:—Archives of Pediatrics, Pediatrics, American Journal of Medical Sciences, American Journal of Roentgenology, American Journal of Surgery, Bulletin of the Johns Hopkins Hospital, American Journal of Public Health, Anales de la Facultad de Medicina de Granada, Medical Journal of South Africa, Indian Journal of Medical Research, Anales de la Facultad de Medicina, Montevideo, Cornhill Magazine, &c.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. H. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. H. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.

THURSDAY.—5.15 P.M., Clinical Lecture.

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY.—4 P.M., Lecture XII.:—Prof. E. W. Hope: Civil Sanitation and the War. Followed by a discussion.

BOOKS, ETC., RECEIVED.

COMMITTEE ON PUBLICATION OF THE AMERICAN SURGICAL ASSOCIATION 1334, Rialto Building, Kansas City, Mo.
Transactions of the American Surgical Association, Vol. XXXIV., 1916. Edited by J. F. Binnie, M.D.

DORNAN, WM. J., Philadelphia, U.S.A.
Transactions of American Gynecological Society, Vol. XLI., 1916.

GOVERNMENT PRINTING OFFICE, Washington.
Index Catalogue of the Library of the Surgeon-General's Office, United States Army. Authors and Subjects. Second Series. Vol. XXI. Waterworth—Zysmari.

ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH, Sixty-sixth-street and Avenue A, New York, U.S.A.
Reprints, Vol. XXV.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

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MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d*. The rates of subscription remain as revised in October.

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METEOROLOGICAL READINGS.

(*Taken daily at 8.30 a.m. by Steward's Instruments.*)

THE LANCET Office, June 27th, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
June 21	...	114	67	53	55	63	Fine
,, 22	0·01	115	68	53	54	60	Cloudy
,, 23	...	110	64	50	55	63	Fine
,, 24	...	112	68	53	53	57	Cloudy
,, 25	0·14	113	72	55	57	59	Cloudy
,, 26	...	112	70	56	56	61	Fine
,, 27	...	114	68	54	54	59	Cloudy

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

Communications, Letters, &c., have been received from—

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